

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Sin J. Lee Examiner #: 76060 Date: 9-16-03
 Art Unit: 1752 Phone Number 30 5-0504 Serial Number: 09/992,560
 Mail Box and Bldg/Room Location: 9865 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: High Resolution Resists for Next Generation
 Inventors (please provide full names): Gonsalves, Kenneth E Lithograph

Earliest Priority Filing Date: 11-5-01

For Sequence Searches Only Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

(Don't panic) — not that many actual abstracts here; pictures for these things are BIG.)
 Please search for a polyhedral oligosilsesquioxane compound

or a polymer that incorporates the polyhedral oligosilsesquioxane component.

Examples for the polyhedral oligosilsesquioxane compound include a compound of formula $\text{Si}_8\text{O}_{12}(\text{OR})_8$,

$\text{Si}_8\text{O}_{12}\text{R}_8$, $\text{Si}_{12}\text{O}_{18}(\text{OR})_{12}$, or $\text{Si}_{12}\text{O}_{18}\text{R}_{12}$

(R → alkyl, (substituted, unsubstituted) cycloalkyl,

silyl,

aryl

aralkyl,

alkenyl)

(Example for the polymer that comprises $\text{Si}_8\text{O}_{12}\text{R}_8$ is attached here)

STAFF USE ONLY

Searcher: ES

Searcher Phone #: _____

Searcher Location: _____

Date Searcher Picked Up: _____

Date Completed: 9-17-03

Searcher Prep & Review Time: 5

Clerical Prep Time: _____

Online Time: 100

Type of Search

NA Sequence (#) _____

AA Sequence (#) _____

Structure (#) (3)

Bibliographic (and)

Litigation _____

Fulltext _____

Patent Family _____

Other _____

Vendors and cost where applicable

STN \$204.75

Dialog _____

Questel/Orbit _____

Dr. Link _____

Lexis/Nexis _____

Sequence Systems _____

WWW/Internet _____

Other (specify) _____

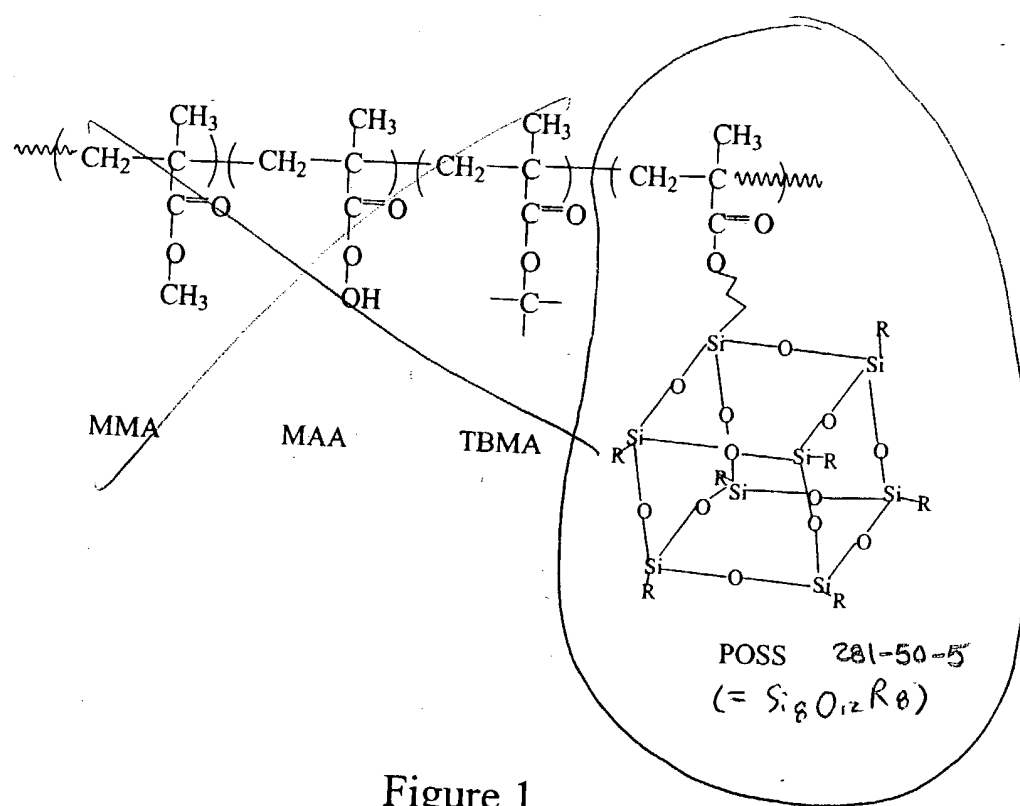


Figure 1

=> file reg

FILE 'REGISTRY' ENTERED AT 13:35:59 ON 17 SEP 2003

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FILE 'REGISTRY' ENTERED AT 12:21:37 ON 17 SEP 2003

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	E H12018SI12
L3	3 S E3
L4	966 S 7080.1.1/RID
L5	18 S 12006.1.1/RID
L6	13 S 12005.1.1/RID
	E H16024SI16
L7	3 S E3
	SEL L7 1-3 RID
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L20	1 S E1
L21	1 S (L5 OR L6 OR L8 OR L10 OR L12 OR L14 OR L16 OR L18 OR L

L22 171 S L4 AND PMS/CI
L23 47 S L5 OR L6 OR L8 OR L10 OR L12 OR L14 OR L16 OR L18 OR L2

FILE 'HCA' ENTERED AT 12:46:08 ON 17 SEP 2003

L24 1 S L21
L25 45 S L23
L26 17286 S POLYHEDR?
L27 61 S POLYHEDR? (3A) (OLIGOSILSESQUIOXAN? OR OLIGO(2A)SILSESQUI
L28 10 S L25 AND L26
L29 1 S L25 AND L27
L30 93 S OLIGOSILSESQUIOXAN? OR OLIGO(2A)SILSESQUIOXAN?
L31 2 S L25 AND L30
L32 127 S L22
L33 635 S L4
L34 62 S L32 AND L26
L35 17 S L32 AND L27
L36 19 S L32 AND L30
L37 35 S L33 AND L27
L38 45 S L33 AND L30

FILE 'REGISTRY' ENTERED AT 12:53:25 ON 17 SEP 2003
E POLYACRYLIC/PCT

L39 281313 S E3
L40 36 S L39 AND L4
L41 0 S L39 AND L23

FILE 'HCA' ENTERED AT 13:02:57 ON 17 SEP 2003

L42 25 S L40
L43 12 S L24 OR L28 OR L29 OR L31
L44 25 S L42 NOT L43
L45 13 S (L35 OR L36) NOT (L43 OR L44)
L46 24 S (L37 OR L38) NOT (L43 OR L44 OR L45)

FILE 'REGISTRY' ENTERED AT 13:35:59 ON 17 SEP 2003

=> file hca

FILE 'HCA' ENTERED AT 13:36:19 ON 17 SEP 2003

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=> d l43 1-12 cbib abs hitstr hitind

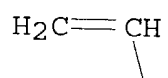
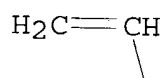
L43 ANSWER 1 OF 12 HCA COPYRIGHT 2003 ACS on STN

138:401895 Application of ion mobility to the gas-phase conformational analysis of **polyhedral** oligomeric silsesquioxanes (POSS).
Gidden, Jennifer; Kemper, Paul R.; Shammel, Erin; Fee, David P.;
Anderson, Stanley; Bowers, Michael T. (Department of Chemistry and
Biochemistry, University of California, Santa Barbara, CA, 93106,
USA). International Journal of Mass Spectrometry, 222(1-3), 63-73
(English) 2003. CODEN: IMSPF8. ISSN: 1387-3806. Publisher:

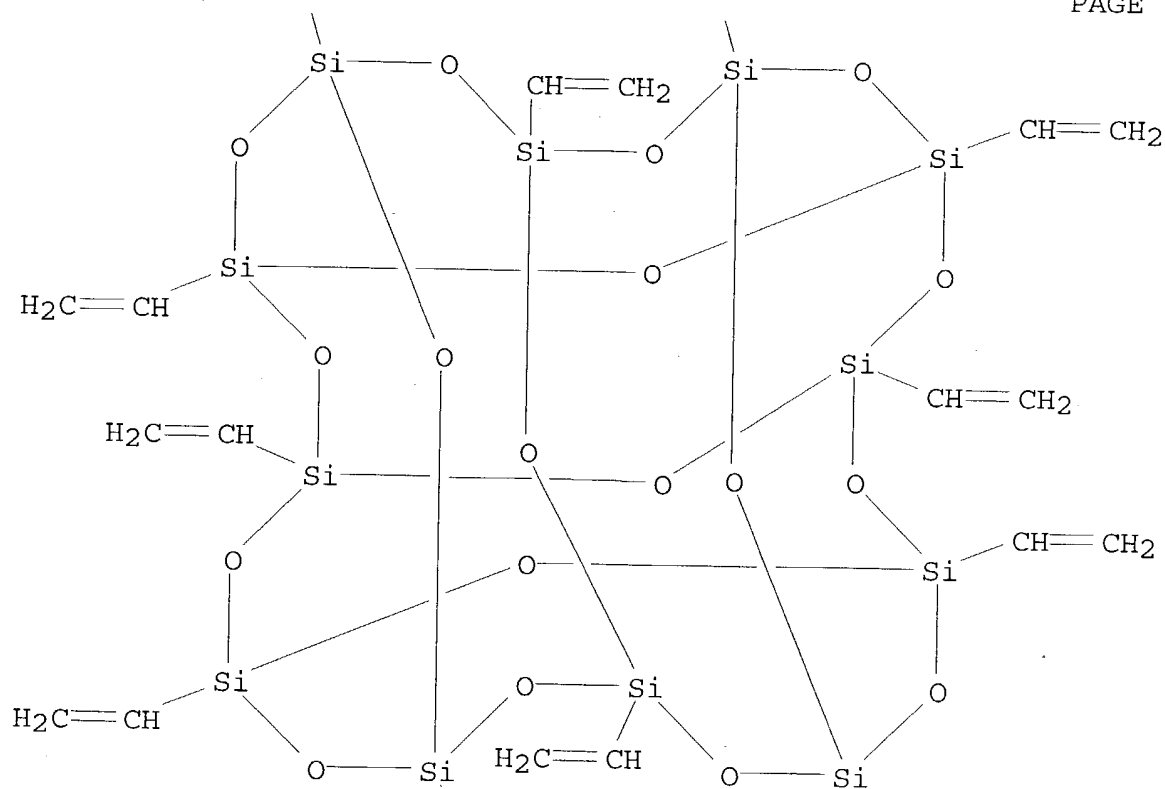
Elsevier Science B.V..

- AB Ion mobility expts. and mol. modeling calcns. were used to investigate the gas-phase conformational properties of various **polyhedral** oligomeric silsesquioxanes (POSS) cationized by sodium. POSS, $(\text{RSiO}_3/2)_n$, has a rigid Si-O cage with org. substituents attached to each Si atom. Na^+ POSS ions were formed by electrospray ionization (ESI) and matrix-assisted laser desorption/ionization (MALDI) and their collision cross-sections were measured in helium using ion mobility methods. Calcd. cross-sections of theor. models of the POSS ions, generated by mol. mechanics (MM) calcns., were compared to expt. for conformational identification. The calcns. predict that the Na^+ ion remains outside of the Si-O cage and binds to one to two oxygen atoms in the cage or interacts with two neighboring org. substituents. Cross-sections of x-ray structures were also compared to the exptl. and theor. data to det. if any changes occur to POSS in the gas phase (compared to the condensed phase) and to provide a check for the geometries predicted by theory (which used untested Si parameters). Several types of POSS compds. were investigated that had different Si-O cage sizes (Si_6O_9 , Si_8O_{12} , $\text{Si}_{10}\text{O}_{15}$, $\text{Si}_{12}\text{O}_{18}$, ...) and different "R" substituents such as cyclohexyl, cyclopropyl, vinyl, and Ph groups. Exptl., theor., and x-ray cross-sections differed by <2% for each POSS compd.
- IT 529486-40-6 529486-44-0
(application of ion mobility to the gas-phase conformational anal. of **polyhedral** oligomeric silsesquioxanes (POSS))
- RN 529486-40-6 HCA
- CN Heptacyclo[11.11.1.13,11.15,21.17,19.19,17.115,23]dodecasiloxane, dodecaethenyl- (9CI) (CA INDEX NAME)

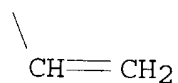
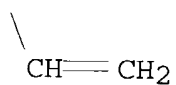
PAGE 1-A



PAGE 2-A

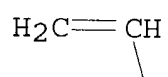
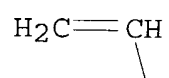


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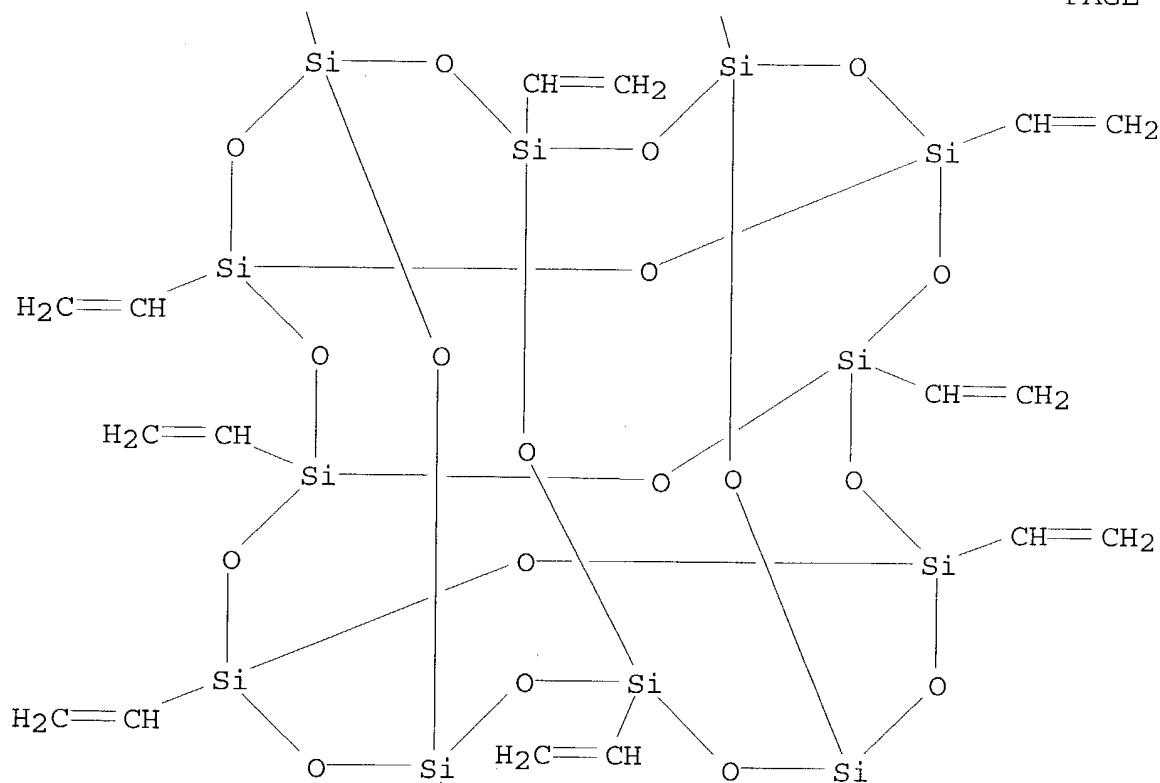


RN 529486-44-0 HCA
CN Heptacyclo[13.9.1.13,13.15,11.17,21.19,19.117,23]dodecasiloxane,
dodecaethenyl-, compd. with sodium ion (Na^+) (1:1) (9CI) (CA INDEX
NAME)

PAGE 1-A



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PAGE 3-A

● Na⁺

CC 29-14 (Organometallic and Organometalloidal Compounds)
 Section cross-reference(s): 22
 ST ion mobility gas conformational analysis **polyhedral**
 oligomeric silsesquioxane POSS; mol mechanics conformational
 analysis **polyhedral** oligomeric silsesquioxane POSS
 IT Conformation
 Electrospray ionization mass spectrometry
 Ion mobility
 Molecular mechanics
 Molecular modeling

Neighboring group participation

Substituent effects

(application of ion mobility to the gas-phase conformational anal. of **polyhedral** oligomeric silsesquioxanes (POSS))

IT Silsesquioxanes

(application of ion mobility to the gas-phase conformational anal. of **polyhedral** oligomeric silsesquioxanes (POSS)).

IT Molecular structure

(optimized; application of ion mobility to the gas-phase conformational anal. of **polyhedral** oligomeric silsesquioxanes (POSS))

IT Laser ionization mass spectrometry

(photodesorption, matrix-assisted; application of ion mobility to the gas-phase conformational anal. of **polyhedral** oligomeric silsesquioxanes (POSS))

IT Laser desorption mass spectrometry

(photoionization, matrix-assisted; application of ion mobility to the gas-phase conformational anal. of **polyhedral** oligomeric silsesquioxanes (POSS))

IT 3553-72-8 4115-83-7 5256-79-1 71682-48-9 126362-01-4

248909-82-2 343216-96-6 **529486-40-6** 529486-41-7

529486-42-8 529486-43-9 **529486-44-0** 529486-45-1

529486-46-2 530102-71-7

(application of ion mobility to the gas-phase conformational anal. of **polyhedral** oligomeric silsesquioxanes (POSS))

L43 ANSWER 2 OF 12 HCA COPYRIGHT 2003 ACS on STN

138:8744 Insertion Mechanism of N₂ and O₂ into T_n(n = 8, 10, 12)-Silsesquioxane Framework. Tejerina, Baudilio; Gordon, Mark S. (Department of Chemistry, Iowa State University, Ames, IA, 50011, USA). Journal of Physical Chemistry B, 106(45), 11764-11770 (English) 2002. CODEN: JPCBFK. ISSN: 1520-6106. Publisher: American Chemical Society.

AB The process of insertion of mol. oxygen and nitrogen into **polyhedral** oligomeric silsesquioxanes (POSS) has been investigated theor. Using ab initio methods, the N₂ interaction with the POSS has been described with RHF (RHF) with a triple- ζ basis set, while systems involving O₂ require restricted open shell (ROHF) wave functions, to account for their open-shell ground states. This insertion process is described in terms of the energetic change that the system X₂::POSS undergoes when the gas mol. passes from the exterior to the interior of the cage through the largest of its faces. The formation of the cluster occurs through a transition structure that has been characterized for each system. The barrier is a function of the dimension of the face of the POSS and, hence, of the cage dimensions. The results of the calcn. are consistent with exptl. observations that the O₂ mols. pass through a given membrane more easily than N₂.

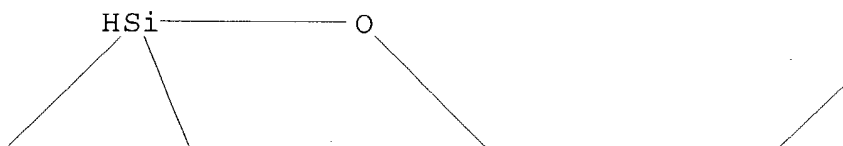
IT 330-26-7 330-27-8

(insertion mechanism of N₂ and O₂ into T_n(n = 8, 10, 12)-silsesquioxane framework)

RN 330-26-7 HCA

CN Heptacyclo[11.11.1.13,11.15,21.17,19.19,17.115,23]dodecasiloxane
(8CI, 9CI) (CA INDEX NAME)

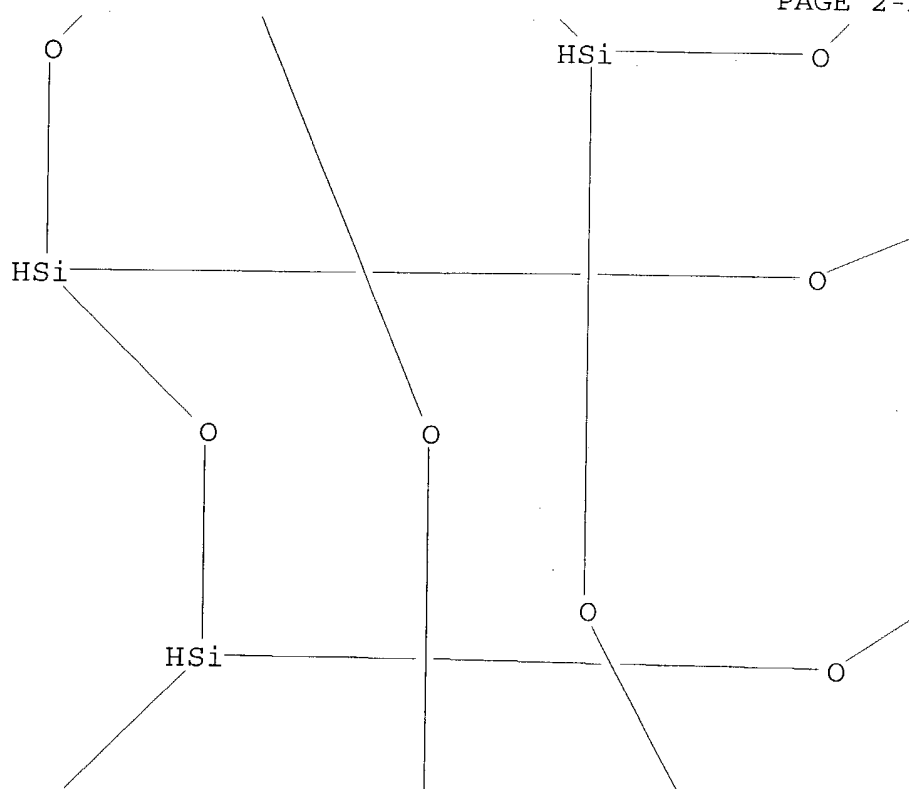
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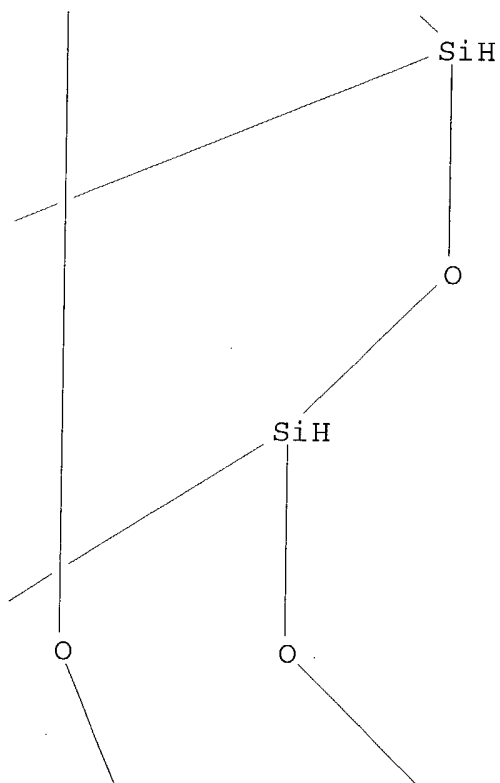
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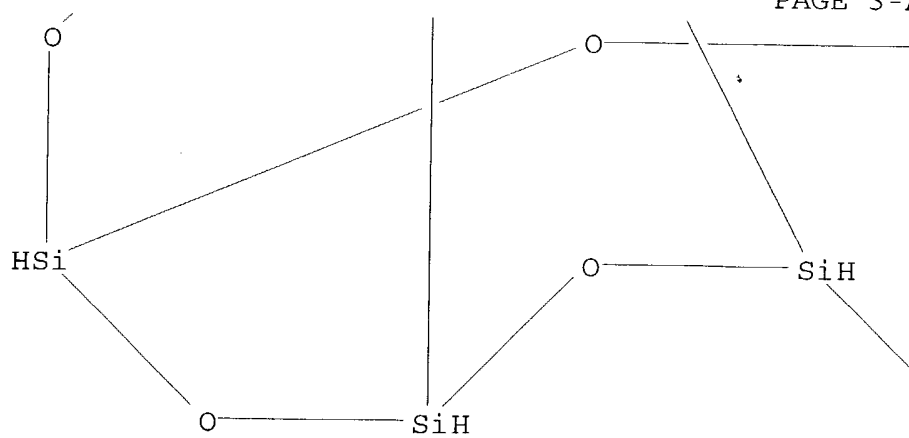
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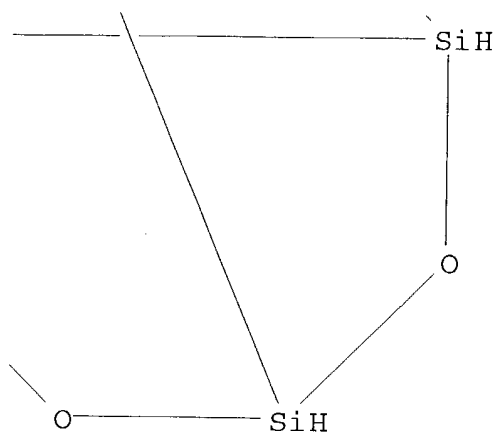
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PAGE 3-A



PAGE 3-B

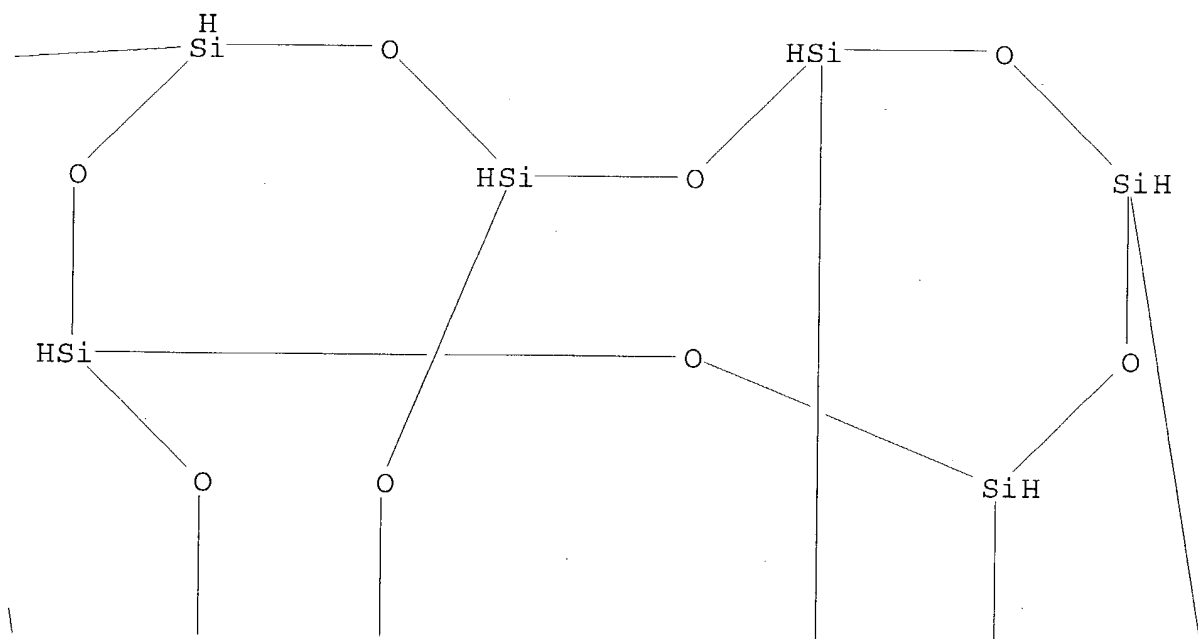


RN 330-27-8 HCA
 CN Heptacyclo[13.9.1.13,13.15,11.17,21.19,19.117,23]dodecasiloxane
 (8CI, 9CI) (CA INDEX NAME)

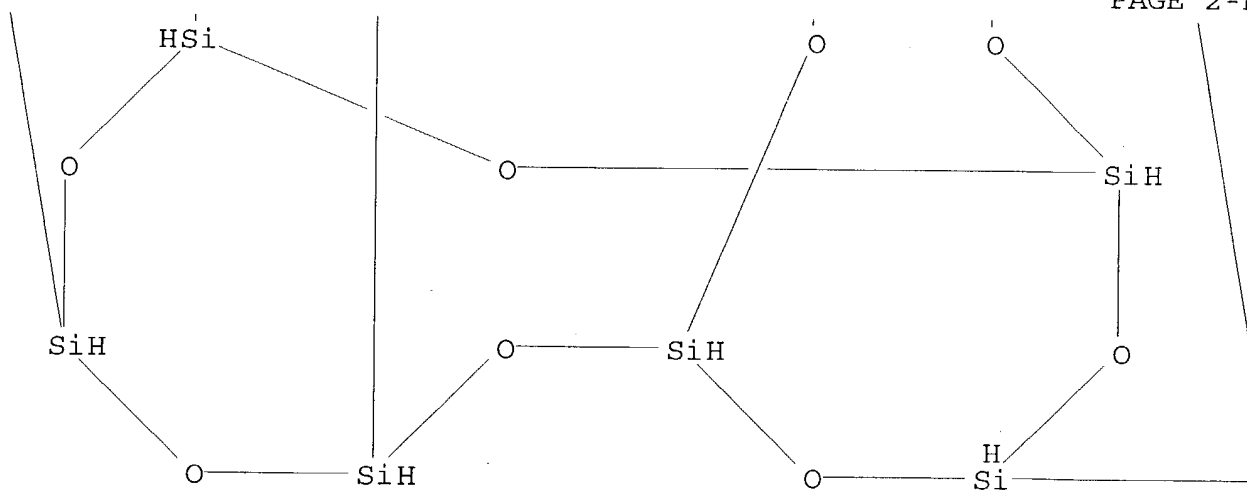
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PAGE 1-B



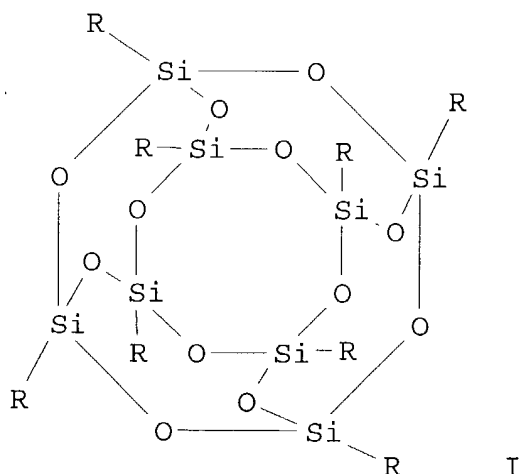
PAGE 2-B



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/O

- CC 67-3 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
 Section cross-reference(s): 65
- IT 281-49-2 281-50-5 **330-26-7 330-27-8**
 7727-37-9, Nitrogen, reactions 7782-44-7, Oxygen, reactions
 (insertion mechanism of N₂ and O₂ into T_n(n = 8, 10, 12)-silsesquioxane framework)
- L43 ANSWER 3 OF 12 HCA COPYRIGHT 2003 ACS on STN
 137:338618 Polyoxyphenylene compositions with good fire and impact resistance. Kamo, Hiroshi; Ikeda, Masanori; Kuga, Shingo (Asahi Kasei Corporation, Japan). Jpn. Kokai Tokkyo Koho JP 2002317112 A2 20021031, 14 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2002-34974 20020213. PRIORITY: JP 2001-39483 20010216.
- GI



AB The compns. comprise (A) 100 parts polymers contg. (a) 30-99% polyoxyphenylenes and (b) 1-70% liq.-cryst. polyesters and (B) 0.1-30 parts **polyhedral** silsesquioxanes or their cleaved structures. Thus, a compn. contg. poly(2,6-dimethyl-1,4-phenylene ether) 95, p-hydroxybenzoic acid-2-hydroxy-6-naphthoic acid copolymer 5, and **polyhedral** silsesquioxane I (R = isobutyl) 1 part was injection-molded to give a test piece showing dielec. const. 2.51, dielec. loss tangent 1.8 .times. 10⁻³, and good heat resistance.

IT **473908-63-3**
(fireproofing agent; polyoxyphenylene compns. with good mech. and elec. properties)

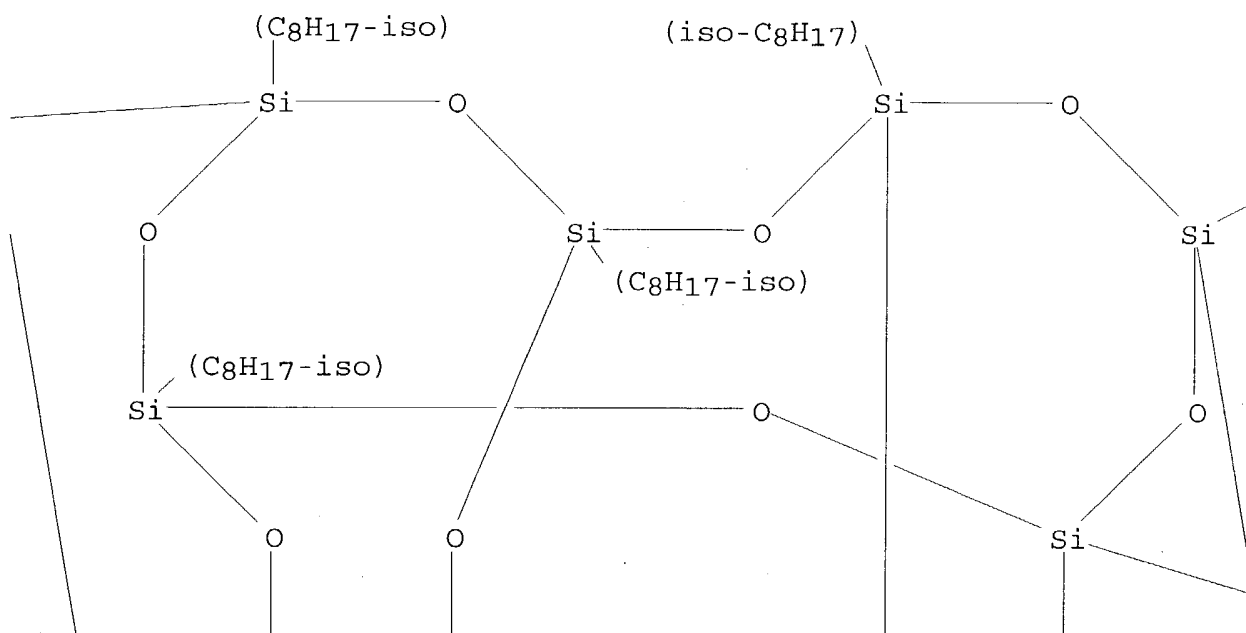
RN 473908-63-3 HCA

CN Heptacyclo[13.9.1.13,13.15,11.17,21.19,19.117,23]dodecasiloxane, dodecaisooctyl- (9CI) (CA INDEX NAME)

PAGE 1-A

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PAGE 1-B



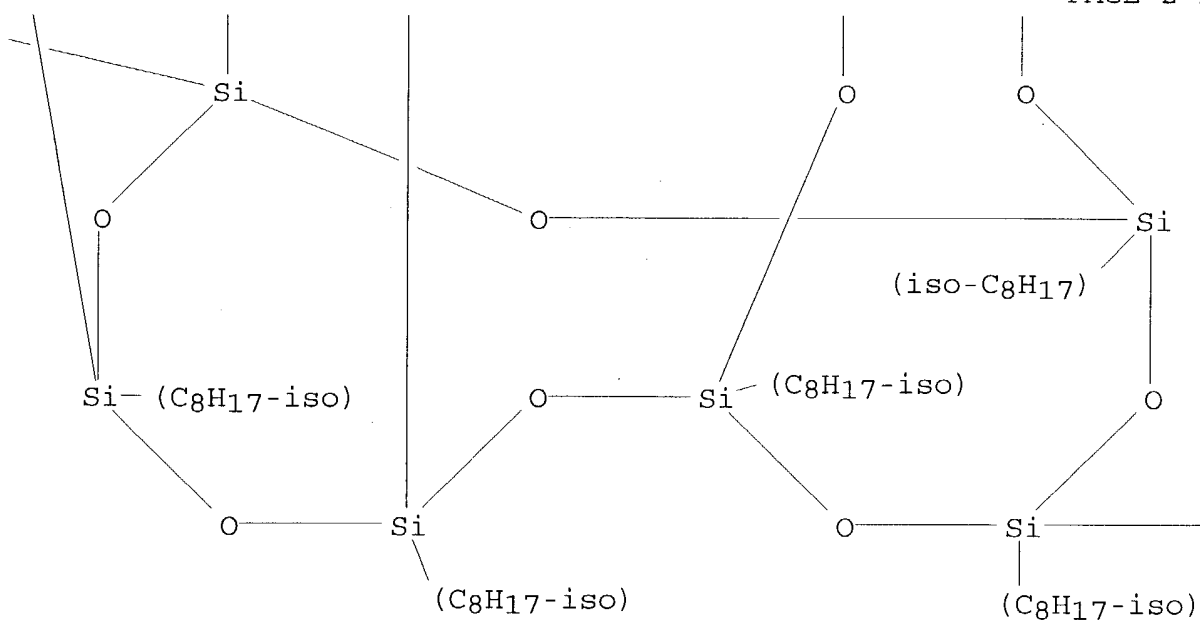
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(C₈H₁₇-iso)

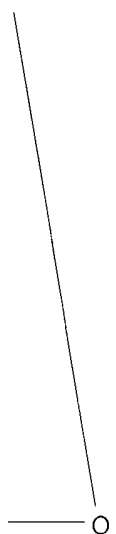
1 (C₈H₁₇-iso)

PAGE 2-A
(iso-C₈H₁₇)

PAGE 2-B



PAGE 2-C



IC ICM C08L071-12
 ICS C08K003-00; C08K005-3492; C08K005-5415; C08L067-00; C08L083-04
 CC 37-6 (Plastics Manufacture and Processing)
 Section cross-reference(s): 75
 IT Silsesquioxanes
 (polyhedral, fireproofing agents; polyoxyphenylene)

comps. with good mech. and elec. properties)

IT 108-78-1, Melamine, uses 1502-47-2, Melem 32131-17-2, Leona
1300S, uses 32518-77-7, Melon 221326-46-1 307531-92-6
444619-05-0 **473908-63-3**

(fireproofing agent; polyoxyphenylene comps. with good mech. and
elec. properties)

L43 ANSWER 4 OF 12 HCA COPYRIGHT 2003 ACS on STN

137:186315 Viscoelastic and mechanical properties of vinyl ester
(VE)/multifunctional **polyhedral** oligomeric silsesquioxane
(POSS) nanocomposites and multifunctional POSS-styrene copolymers.
Li, G. Z.; Wang, L.; Toghiani, H.; Daulton, T. L.; Pittman, C. U.
(Department of Chemistry, Mississippi State University, Mississippi
State, MS, 39762, USA). Polymer, 43(15), 4167-4176 (English) 2002.
CODEN: POLMAG. ISSN: 0032-3861. Publisher: Elsevier Science Ltd..
AB Vinyl ester (VE) composites contg. chem. bonded, multifunctional
polyhedral oligomeric silsesquioxane (POSS), POSS-1
((C₆H₅CHCHO)₄(Si₈O₁₂)(CH:CHC₆H₅)₄), nanoparticles were prepd. with
VE/POSS-1 95/5 and 90/10 wt./wt. ratios. The mole percents of
POSS-1 in these two composites are low (<0.5 and <1%, resp.) due to
the high mass of POSS-1 (mwt=1305). VE composites of two
non-functional POSS-3 (octaisobutyl POSS) and POSS-4 (dodecaphenyl
POSS) derivs. were also prepd. with 95/5 wt./wt. comps. Addnl.,
POSS-1 was also incorporated into styrene copolymers at levels of 5
wt% (0.42 mol%) and 10 wt% (0.88 mol%) of POSS-1. The composites
and copolymers were characterized by dynamic mech. thermal anal. and
mech. testing. The POSS-1 units incorporated into the vinyl ester
network were well dispersed. No phase-sepn. in the VE/POSS-1 90/10
composite could be detected by TEM from low to 8.times.105
magnification. In VE composites contg. 10 wt% POSS-1, silicon-rich
phases were obsd. ranging in size from a few nm to .apprx.75 nm by
electron energy loss spectroscopy (EELS). TEM, EDXS, EELS and extn.
studies suggest that some POSS-1-rich nanoparticles in the VE/POSS-1
90/10 composite are present and also a fraction of the POSS-1 is
molecularly dispersed within the VE resin. The POSS-1-rich
dispersed phase portion is cross-linked, insol. and contains some
VE. VE/POSS-3 and VE/POSS-4 composites exhibited larger-sized POSS
phases which do not contain VE. Incorporating low mole percentages
of POSS-1 into the VE network by chem. bonds or blending
non-functional POSS-3 or 4 into VE resin have almost no influence on
Tg or on the width of the tan .delta. peak in the glass transition
range. POSS-1-styrene copolymers exhibit good miscibility at 5 wt%
POSS-1 but serious phase-sepn. occurs in the copolymer with 10 wt%
POSS-1 content. POSS-1-styrene copolymers swelled but did not
dissolve in THF (THF) demonstrating they had been cross-linked by
POSS-1. No POSS-1 was extd. into the THF. The POSS-1-styrene
copolymers have higher Tg values vs. pure polystyrene (PS) prepd. at
the same conditions. The Tg elevation could be due to the
crosslinking resulting from the four .beta.-substituted styryl
functions in POSS-1 and due to the effect of high mol. wt. POSS
units retarding segmental motion of a portion of the chain segments.
The Tg of the 10 wt% POSS-1 copolymer is almost the same as that of

the 5 wt% POSS-1 copolymer because the continuous phase in the 10 wt% POSS-1 copolymer might have a crosslinking d. similar to that of the 5 wt% POSS-1 copolymer. The low POSS-1 mol percentage means that many all-styrene segments exist that can undergo segmental motion without being retarded by POSS. The tan .delta. peak for 10 wt% POSS-1 copolymer is much broader and less intense than that for PS or 5 wt% POSS-1 copolymer. A higher av. crosslinking d. and much less segmental motion in the dispersed POSS-1-rich phase account for this behavior in the 10 wt% copolymer. The bending storage modulus, E', values of the VE/POSS-1 composites and the POSS-1-styrene copolymers are higher than those of either the neat vinyl ester resin or pure PS, resp., over entire temp. range, esp. at the low POSS-1 content (5 wt%). The incorporation of multifunctional POSS-1 into vinyl ester or PS by chem. bonding improves the thermal dimensional stabilities. The flexural modulus of the vinyl ester resin is raised by incorporation of POSS-1 while the flexural strengths are lowered. VE resin and VE/POSS-1 composites gave negligible wt. gains after 50 days in toluene. The VE and composite samples cracked and fragmented after submersion in THF.

IT 18923-59-6

(viscoelastic and mech. properties of vinyl ester/multifunctional **polyhedral** oligomeric silsesquioxane nanocomposites and copolymers)

RN 18923-59-6 HCA

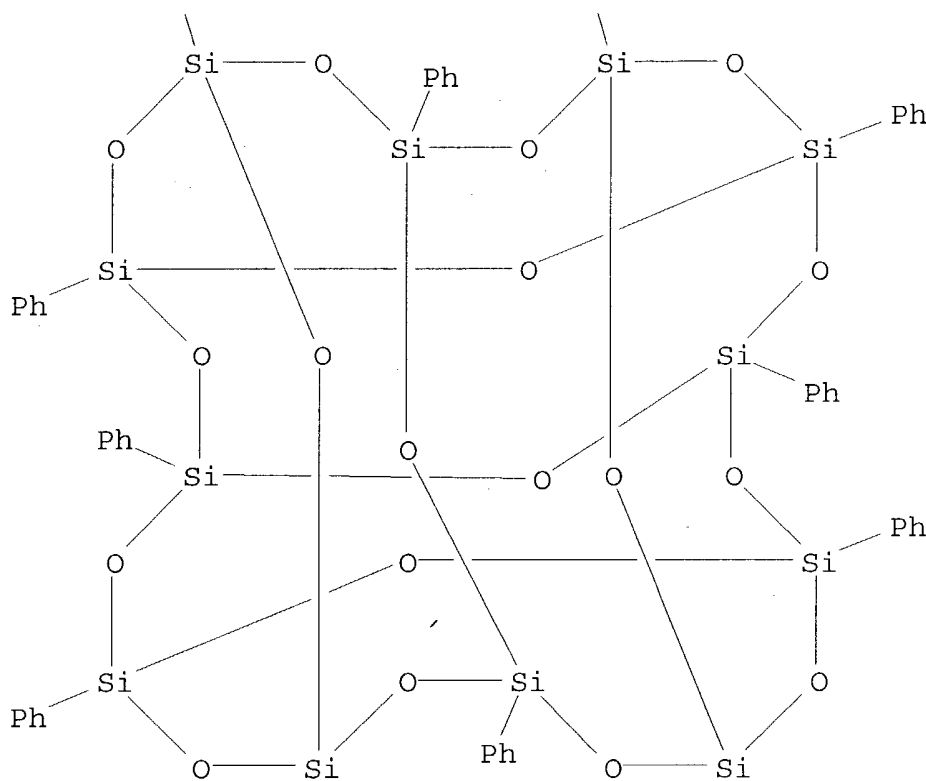
CN Heptacyclo[11.11.1.13,11.15,21.17,19.19,17.115,23]dodecasiloxane, dodecaphenyl- (7CI, 8CI, 9CI) (CA INDEX NAME)

PAGE 1-A

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Ph
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PAGE 3-A

- CC 37-6 (Plastics Manufacture and Processing)
- IT Vinyl compounds, properties
 (ester group-contg., polymers; viscoelastic and mech. properties
 of vinyl ester/multifunctional **polyhedral** oligomeric
 silsesquioxane nanocomposites and copolymers)
- IT Bending strength
 Mechanical loss
 Polymer morphology
 Storage modulus
 Viscoelasticity
 (viscoelastic and mech. properties of vinyl ester/multifunctional
polyhedral oligomeric silsesquioxane nanocomposites and
 copolymers)
- IT Silsesquioxanes

(viscoelastic and mech. properties of vinyl ester/multifunctional **polyhedral** oligomeric silsesquioxane nanocomposites and copolymers)

IT 449735-25-5P

(viscoelastic and mech. properties of vinyl ester/multifunctional **polyhedral** oligomeric silsesquioxane nanocomposites and copolymers)

IT 18923-59-6 209913-35-9 221326-46-1 386264-42-2

(viscoelastic and mech. properties of vinyl ester/multifunctional **polyhedral** oligomeric silsesquioxane nanocomposites and copolymers)

L43 ANSWER 5 OF 12 HCA COPYRIGHT 2003 ACS on STN

134:179001 Process for the formation of **polyhedral** oligomeric silsesquioxanes. Lichtenhan, Joseph D.; Schwab, Joseph J.; Reinerth, William; Carr, Michael J.; An, Yi-zong; Feher, Frank J.; Terroba, Rachel (Hybrid Plastics, USA). PCT Int. Appl. WO 2001010871 A1 20010215, 45 pp. DESIGNATED STATES: W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). CODEN: PIXXD2. APPLICATION: WO 2000-US21455 20000803. PRIORITY: US 1999-PV147435 19990804.

AB Three processes for the manuf. of **polyhedral** oligomeric silsesquioxanes (POSS) which utilize the action of bases that are capable of either attacking silicon or any compd. that can react with a protic solvent (e.g., ROH, H₂O etc.) and generate hydroxide [OH]⁻; alkoxide [RO]⁻, etc. The first process utilizes such bases to effectively redistribute the silicon-oxygen frameworks in polymeric silsesquioxanes [RSiO_{1.5}]_{inf} where inf = 1-1,000,000 or higher into POSS nanostructures of formulas [(RSiO_{1.5})_n].sum.#, homoleptic, [(RXSiO_{1.5})_n].sum.#, functionalized homoleptic, [(RSiO_{1.5})_m(R'SiO_{1.5})_n].sum.#, heteroleptic, {(RSiO_{1.5})_m(RXSiO_{1.0})_n}.sum.#, and functionalized heteroleptic nanostructures. The second process utilizes base to aid in the formation of POSS nanostructures of formulas [(RSiO_{1.5})_n].sum.#, homoleptic and [(RSiO_{1.5})_m(R'SiO_{1.5})_n].sum.#, heteroleptic and [(RSiO_{1.5})_m(RXSiO_{1.0})_n].sum.#, functionalized heteroleptic nanostructures from silanes RSiX₃ and linear or cyclic silsesquioxanes of the formula RX₂Si-(OSiRX)_m-OSiRX₂ where m=0-10, X=OH, Cl, Br, I, alkoxide OR, acetate OOCR, peroxide OOR, amine NR₂, isocyanate NCO, and R. The third process utilizes base to selectively ring-open the silicon-oxygen-silicon (Si-O-Si) bonds in POSS structures to form POSS species with incompletely condensed nanostructures. These processes also afford stereochem. control over X. The three processes result in new POSS species that can undergo addnl. chem. manipulations to ultimately be converted into POSS-species suitable for polymn., grafting, or other desirable

chem. reactions.

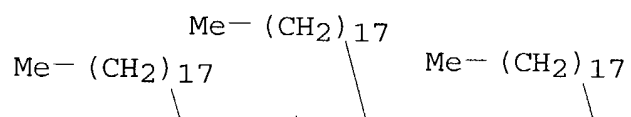
IT 326621-06-1P

(process for formation of **polyhedral** oligomeric
silsesquioxanes)

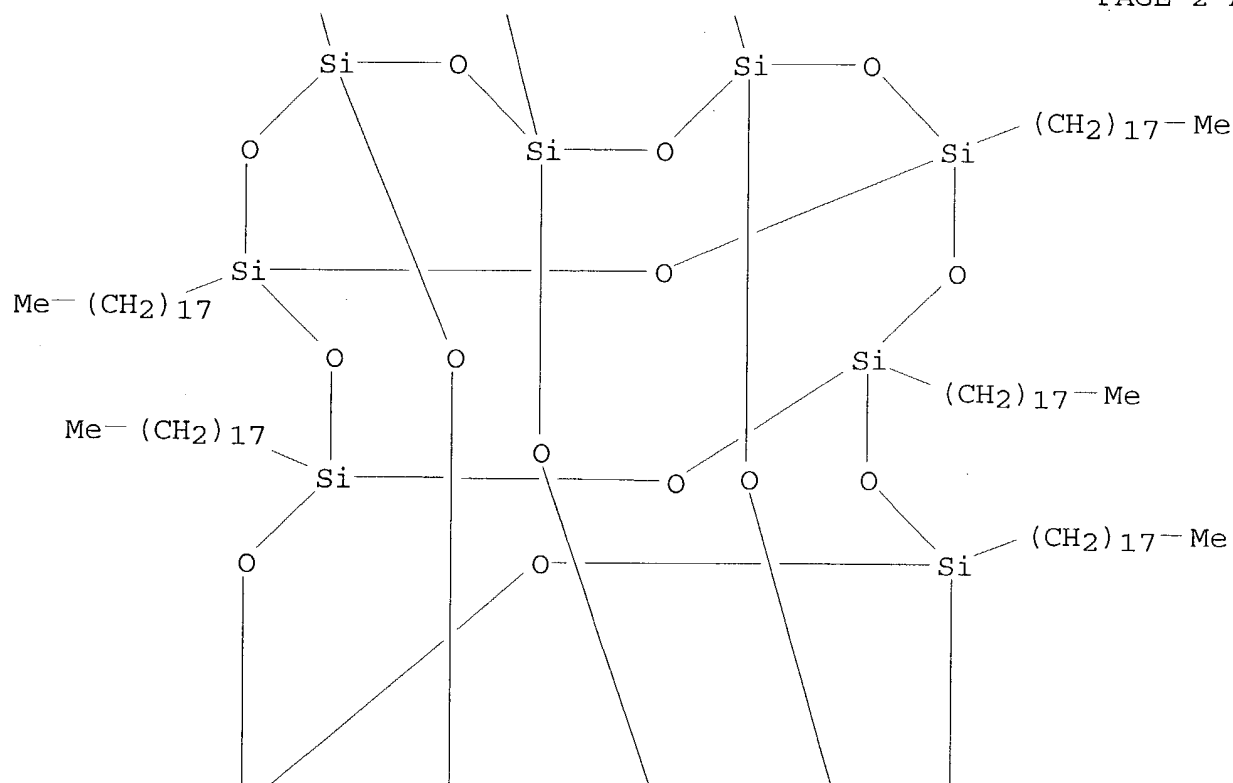
RN 326621-06-1 HCA

CN Heptacyclo[11.11.1.13,11.15,21.17,19.19,17.115,23]dodecasiloxane,
dodecaoctadecyl- (9CI) (CA INDEX NAME)

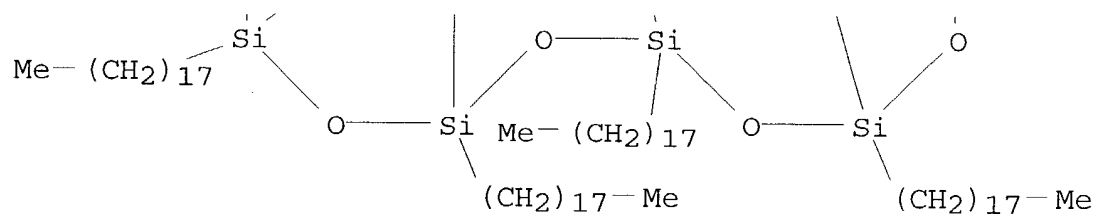
PAGE 1-A



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PAGE 3-A



IT 18923-59-6P

(process for formation of **polyhedral** oligomeric silsesquioxanes)

RN 18923-59-6 HCA

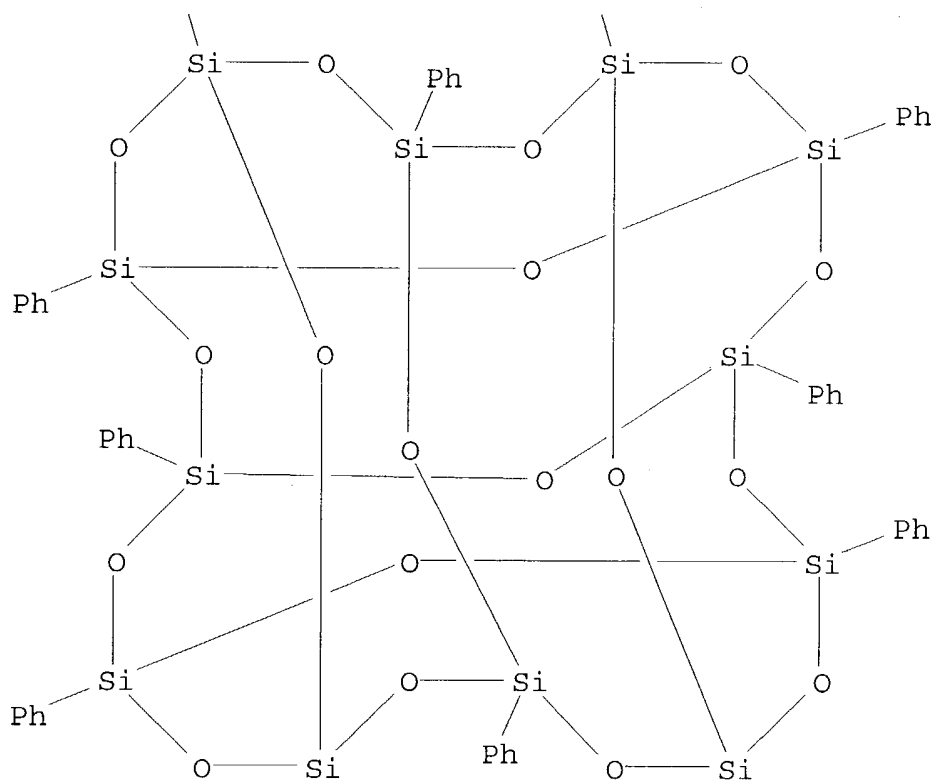
CN Heptacyclo[11.11.1.13,11.15,21.17,19.19,17.115,23]dodecasiloxane, dodecaphenyl- (7CI, 8CI, 9CI) (CA INDEX NAME)

PAGE 1-A

Ph
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Ph
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PAGE 2-A



PAGE 3-A

Ph

Ph

- IC ICM C07F007-08
ICS C08G077-06
- CC 35-7 (Chemistry of Synthetic High Polymers)
- ST nanostructure POSS siloxane silsesquioxane oligomer manuf;
polyhedral silsesquioxane oligomer manuf; cage polymer
silsesquioxane oligomer POSS
- IT Bases, uses
(catalyst; process for formation of **polyhedral**
oligomeric silsesquioxanes)
- IT Silsesquioxanes
(reactant; process for formation of **polyhedral**
oligomeric silsesquioxanes)
- IT 75-59-2, Tetramethylammonium hydroxide 100-85-6,
Trimethylbenzylammonium hydroxide 1310-58-3, Potassium hydroxide,

uses

(catalyst; process for formation of **polyhedral** oligomeric silsesquioxanes)

IT 160511-97-7P, Phenyltrichlorosilane hydrolytic homopolymer
(intermediate; process for formation of **polyhedral** oligomeric silsesquioxanes)

IT 3809-28-7P 17865-85-9P 18971-70-5P 75899-36-4P 149311-20-6P
154346-59-5P 183387-28-2P 254747-22-3P 307531-90-4P
307531-92-6P 326621-03-8P 326621-04-9P 326621-05-0P
326621-06-1P 326621-07-2P 326621-08-3P 326621-09-4P
326621-10-7P 326621-11-8P 326621-12-9P 326621-13-0P
326621-14-1P 326621-15-2P 326621-16-3P 326621-17-4P
326621-18-5P 326621-19-6P 326621-20-9P 326621-21-0P
326621-22-1P 326621-23-2P 326864-50-0P 326865-04-7P
326865-07-0P 326865-09-2P

(process for formation of **polyhedral** oligomeric silsesquioxanes)

IT 5256-79-1P, Octa(phenylsilsesquioxane) **18923-59-6P**
19086-35-2P 47904-22-3P 69655-76-1P, Octa(vinylsilsesquioxane)
85233-78-9P 92888-99-8P 119329-56-5P 221326-46-1P
230316-02-6P 268202-73-9P 308103-65-3P 326620-92-2P
326620-98-8P 326620-99-9P 326621-00-5P 326864-92-0P
326864-95-3P

(process for formation of **polyhedral** oligomeric silsesquioxanes)

IT 2768-02-7, Vinyltrimethoxysilane 100691-57-4 226726-51-8
326621-24-3 326621-25-4

(reactant for cross reaction or rearrangement reaction; process for formation of **polyhedral** oligomeric silsesquioxanes)

IT 75-77-4, reactions 556-67-2 1719-58-0, Vinyltrimethylchlorosilane
7351-61-3 18301-56-9 198570-38-6 326865-15-0

(reactant for cross reaction; process for formation of **polyhedral** oligomeric silsesquioxanes)

IT 18395-30-7, Isobutyltrimethoxysilane 180537-00-2 326865-12-7
(reactant; process for formation of **polyhedral** oligomeric silsesquioxanes)

IT 31451-78-2 157374-41-9, Phenylsilanetriol homopolymer
326620-90-0 326620-91-1 326620-93-3 326620-94-4 326620-95-5
326620-97-7

(starting substrate; process for formation of **polyhedral** oligomeric silsesquioxanes)

IT 3325-29-9 25498-03-7, Methyltrimethoxysilane homopolymer
33293-03-7 326620-96-6 326621-02-7

(starting substrate; process for formation of **polyhedral** oligomeric silsesquioxanes)

L43 ANSWER 6 OF 12 HCA COPYRIGHT 2003 ACS on STN

133:252499 Synthesis of **polyhedral** hexa-, octa-, deca- and dodeca-silsesquioxanes separation by NP-HPLC, SEC and LAC characterization by MALDI-TOF-MS. Kruger, Ralph-Peter; Much, Helmut; Schulz, Gunter; Rikowski, Eckhard (Bundesanstalt fur Materialforschung und-prufung, Berlin, D-12205, Germany).

Organosilicon Chemistry IV: From Molecules to Materials, [Lectures and Poster Contributions presented at the Muechner Silicontagel], 4th, Muechen, Apr., 1998, Meeting Date 1998, 545-550. Editor(s): Auner, Norbert; Weis, Johann. Wiley-VCH Verlag GmbH: Weinheim, Germany. (English) 2000. CODEN: 68ZMAL.

AB **Polyhedral** silsesquioxanes $R_n(\text{SiO}_{1.5})_n$ with $n = 6, 8, 10, 12$ and $R = \text{Me}, \text{Et}, n\text{-Pr}, n\text{-Bu}, i\text{-Bu}, n\text{-C}_5\text{H}_{11}, n\text{-C}_6\text{H}_{13}, n\text{-C}_7\text{H}_{15}, n\text{-C}_8\text{H}_{17}, n\text{-C}_9\text{H}_{19}, n\text{-C}_{10}\text{H}_{21}, \text{C}_6\text{H}_5, \text{Cl-C}_3\text{H}_6, \text{Br-C}_3\text{H}_6, \text{I-C}_3\text{H}_6, \text{NCS-C}_3\text{H}_6, \text{C}_6\text{F}_5\text{-C}_3\text{H}_6$, and Me_3SiO can be synthesized by hydrolysis of RSiCl_3 or RSi(OMe)_3 , modification of existing silsesquioxanes or cage rearrangement of octasilsesquioxanes to the greater deca- and dodecasilsesquioxanes. Some of the mixts. of silsesquioxanes produced by cage rearrangements can be sepd. by NP-HPLC, SEC (size exclusion chromatog.) and LAC (liq. affinity chromatog.). These mixts. can also be analyzed by MALDI-TOF-MS using a special matrix.

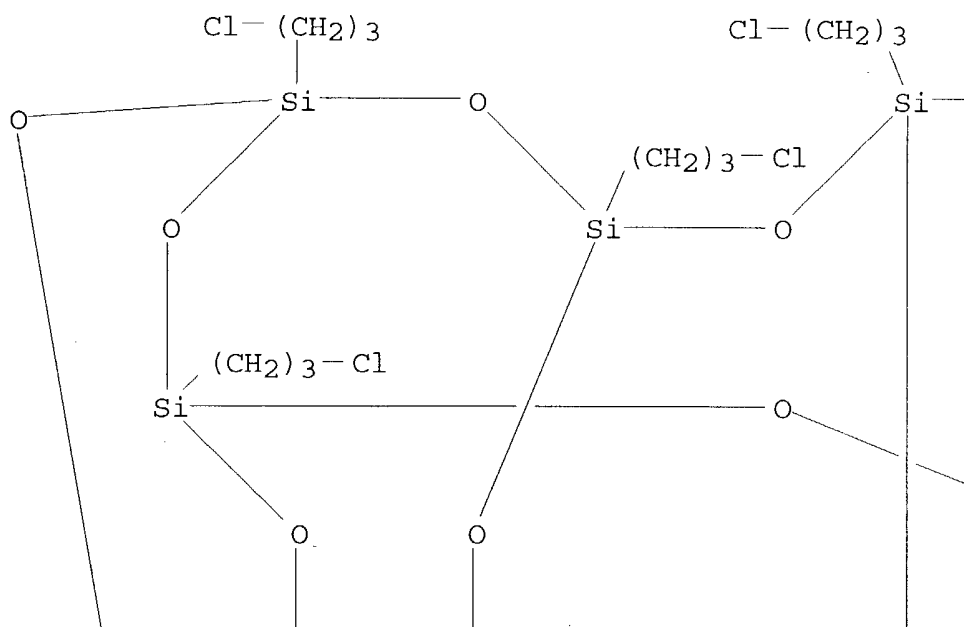
IT **292847-80-4P 294858-85-8P 294858-96-1P**

(synthesis of **polyhedral** hexa-, octa-, deca- and dodeca-silsesquioxanes and sepn. by NP-HPLC, SEC and LAC characterization by MALDI-TOF-MS)

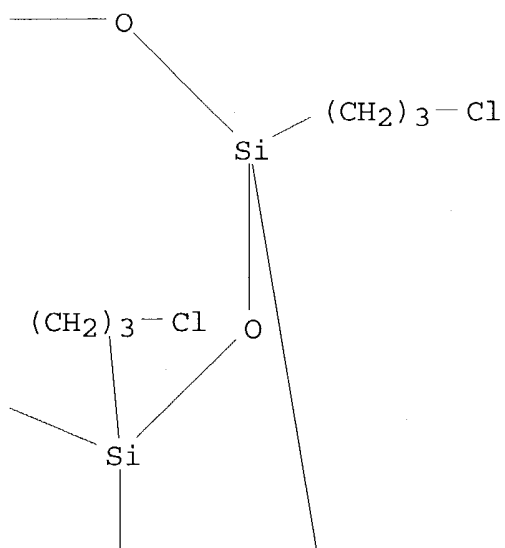
RN 292847-80-4 HCA

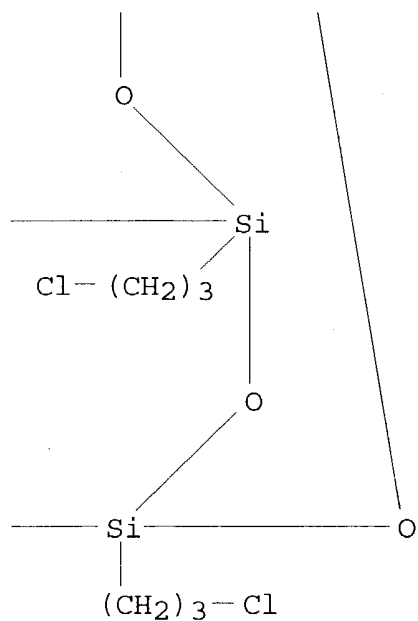
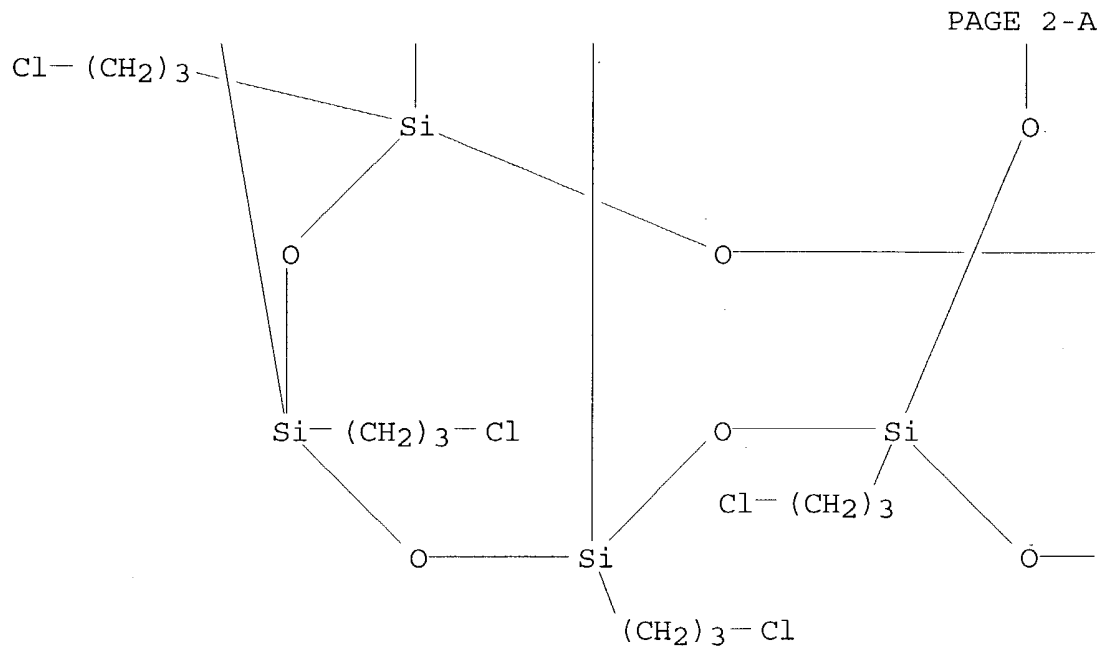
CN Heptacyclo[13.9.1.13,13.15,11.17,21.19,19.117,23]dodecasiloxane, dodecakis(3-chloropropyl)- (9Cl) (CA INDEX NAME)

PAGE 1-A



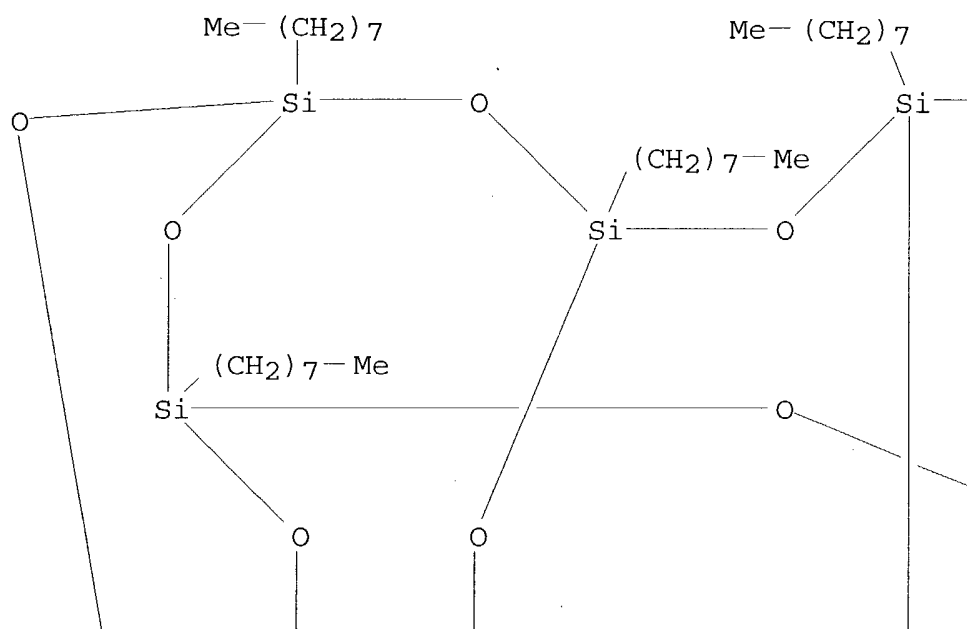
PAGE 1-B



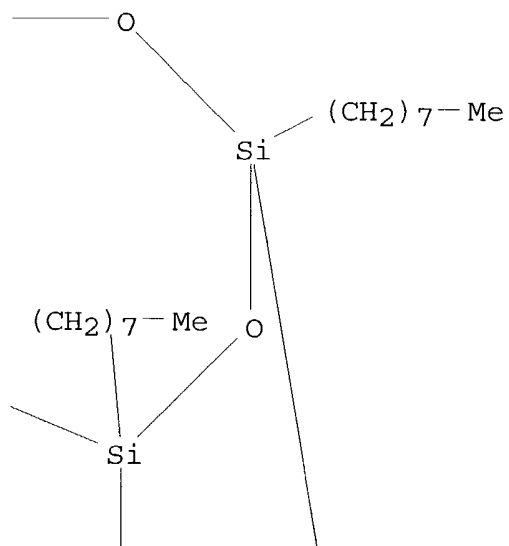


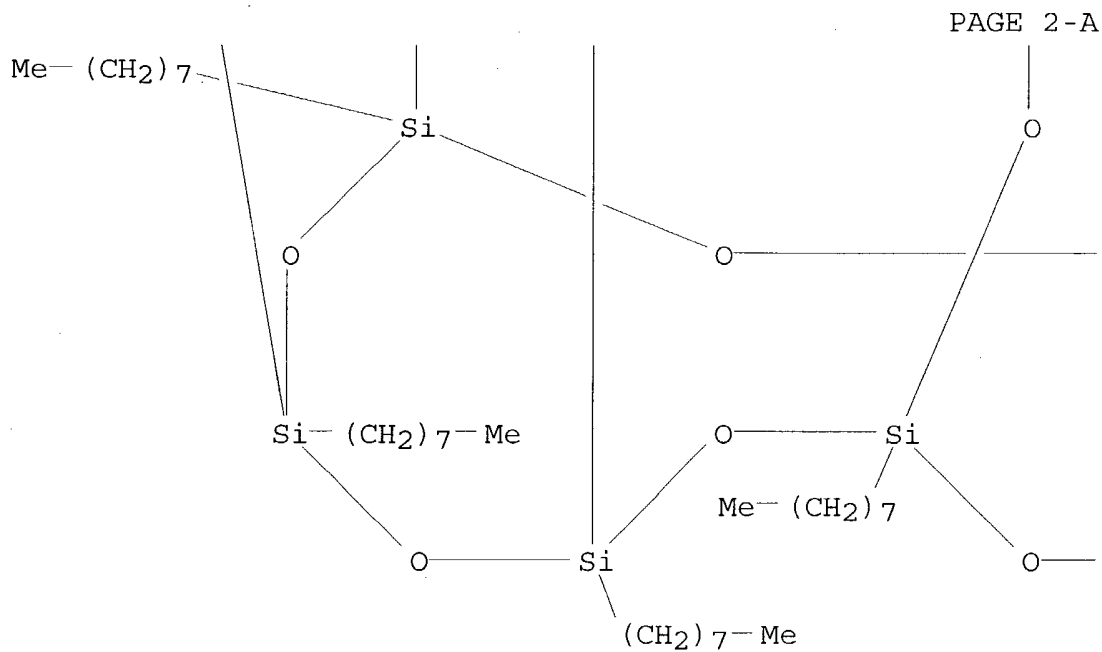
RN 294858-85-8 HCA
CN Heptacyclo[13.9.1.13,13.15,11.17,21.19,19.117,23]dodecasiloxane,
dodecaoctyl- (9CI) (CA INDEX NAME)

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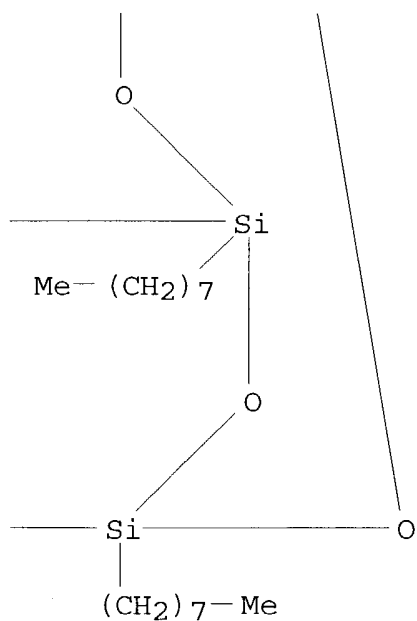


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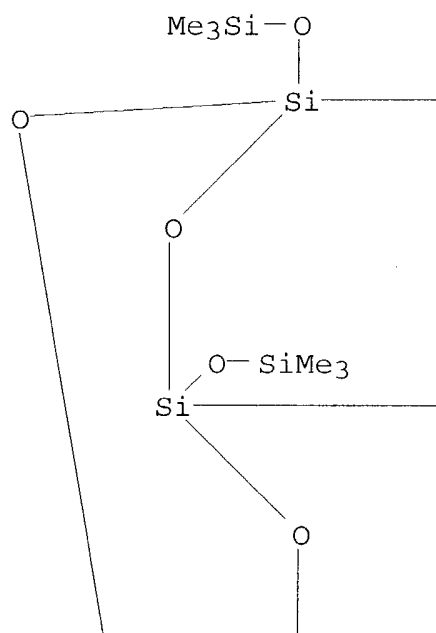


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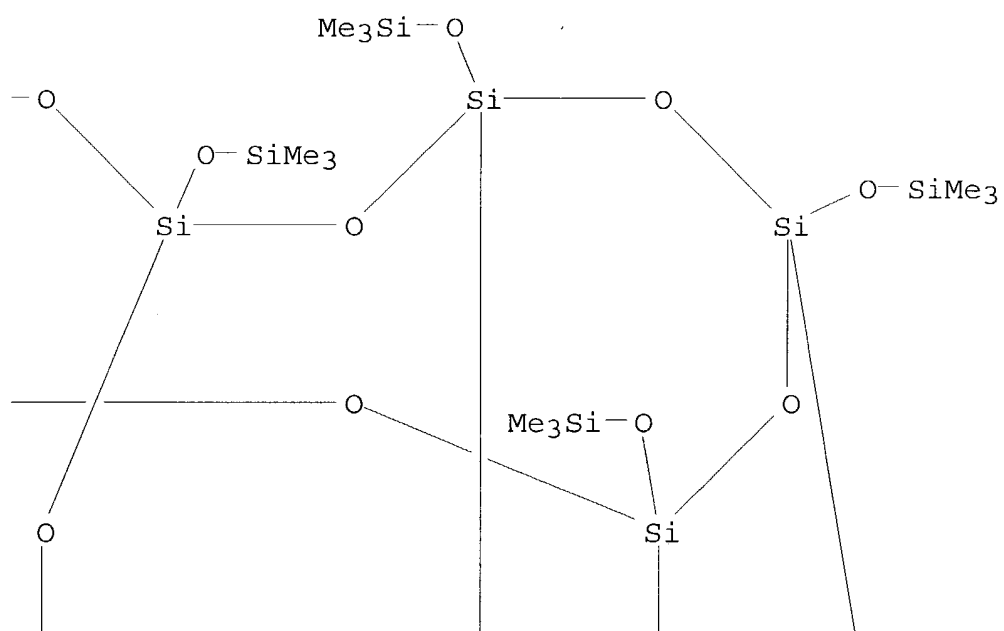


RN 294858-96-1 HCA
 CN Heptacyclo[13.9.1.13,13.15,11.17,21.19,19.117,23]dodecasiloxane,
 dodecakis[(trimethylsilyl)oxy]- (9CI) (CA INDEX NAME)

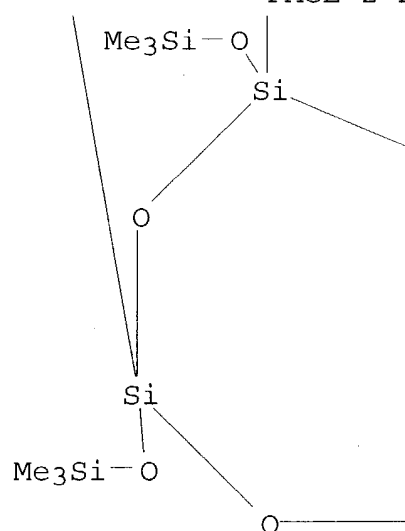
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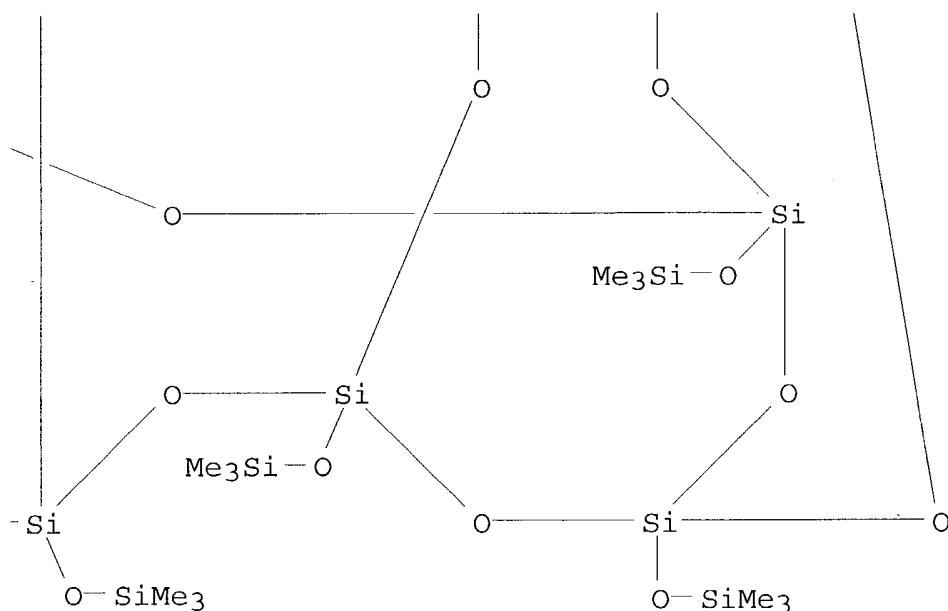
PAGE 1-B



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CC 29-6 (Organometallic and Organometalloidal Compounds)

Section cross-reference(s): 35

ST **polyhedral** hexa octa deca dodeca silsesquioxane prepn HPLC chromatog

IT Mass spectra

(MALDI-TOF; synthesis of **polyhedral** hexa-, octa-, deca- and dodeca-silsesquioxanes and sepn. by NP-HPLC, SEC and LAC characterization by MALDI-TOF-MS)

IT HPLC

(NP; synthesis of **polyhedral** hexa-, octa-, deca- and dodeca-silsesquioxanes and sepn. by NP-HPLC, SEC and LAC characterization by MALDI-TOF-MS)

IT Affinity chromatography

Size-exclusion chromatography

(synthesis of **polyhedral** hexa-, octa-, deca- and dodeca-silsesquioxanes and sepn. by NP-HPLC, SEC and LAC characterization by MALDI-TOF-MS)

IT Silsesquioxanes

(synthesis of **polyhedral** hexa-, octa-, deca- and dodeca-silsesquioxanes and sepn. by NP-HPLC, SEC and LAC characterization by MALDI-TOF-MS)

IT 5256-79-1P 5821-15-8P 17865-85-9P 18971-70-5P 18971-71-6P
 19086-26-1P 51777-38-9P 57755-06-3P 75899-36-4P 154346-57-3P
 161678-38-2P 190732-65-1P 190732-66-2P 190732-67-3P
 190732-68-4P 196200-67-6P 196200-69-8P 196200-84-7P
 196200-85-8P 196200-86-9P 221326-46-1P **292847-80-4P**
294858-85-8P 294858-96-1P

(synthesis of **polyhedral** hexa-, octa-, deca- and

dodeca-silsesquioxanes and sepn. by NP-HPLC, SEC and LAC
characterization by MALDI-TOF-MS)

L43 ANSWER 7 OF 12 HCA COPYRIGHT 2003 ACS on STN

133:238111 Synthesis of homo- and mixed-functionalized octa-, deca- and dodeca-silsesquioxanes by cage rearrangement and their characterization. Rikowski, Eckhard (Universitat-GH Paderborn Anorganische und Analytische Chemie, Paderborn, D-33098, Germany). Organosilicon Chemistry IV: From Molecules to Materials, [Lectures and Poster Contributions presented at the Muechner Silicontagel, 4th, Muechen, Apr., 1998, Meeting Date 1998, 540-544. Editor(s): Auner, Norbert; Weis, Johann. Wiley-VCH Verlag GmbH: Weinheim, Germany. (English) 2000. CODEN: 68ZMAL.

AB The homo- and mixed-functionalized **polyhedral** silsesquioxanes $\text{Pr}_8(\text{SiO}_{1.5})_8$, $\text{Pr}_{10}(\text{SiO}_{1.5})_{10}$, $(\text{Cl}-\text{C}_3\text{H}_6)\text{Pr}_7(\text{SiO}_{1.5})_8$, $(\text{Cl}-\text{C}_3\text{H}_6)-\text{Pr}_9(\text{SiO}_{1.5})_{10}$, $1,2-(\text{Cl}-\text{C}_3\text{H}_6)_2\text{Pr}_6(\text{SiO}_{1.5})_8$, $1,3-(\text{Cl}-\text{C}_3\text{H}_6)_2\text{Pr}_6(\text{SiO}_{1.5})_8$, $1,7-(\text{Cl}-\text{C}_3\text{H}_6)_2\text{Pr}_6(\text{SiO}_{1.5})_8$, $1,2,7-(\text{Cl}-\text{C}_3\text{H}_6)_3\text{Pr}_5(\text{SiO}_{1.5})_8$, $1,3,6-(\text{Cl}-\text{C}_3\text{H}_6)_3\text{Pr}_5(\text{SiO}_{1.5})_8$ and $1,2,3-(\text{Cl}-\text{C}_3\text{H}_6)_3\text{Pr}_5(\text{SiO}_{1.5})_8$ can be synthesized by simultaneous cage rearrangement of $\text{Pr}_8(\text{SiO}_{1.5})_8$ and $(\text{Cl}-\text{C}_3\text{H}_6)_8(\text{SiO}_{1.5})_8$ in a ratio of 7:1. The cage rearrangement mixt. can be sepd. by NP-HPLC. Cage rearrangement of a mixt. of $\text{Pr}_8(\text{SiO}_{1.5})_8$ and $(\text{Cl}-\text{C}_3\text{H}_6)_8(\text{SiO}_{1.5})_8$ in a ratio of 1:7 leads to a mixt. of the homo-functionalized silsesquioxanes $(\text{Cl}-\text{C}_3\text{H}_6)_n(\text{SiO}_{1.5})_n$ with $n = 8, 10, 12$ and the mixed-functionalized silsesquioxane $(\text{Cl}-\text{C}_3\text{H}_6)_9\text{Pr}(\text{SiO}_{1.5})_{10}$. This mixt. can also be sepd. by NP-HPLC. The new mixed-functionalized silsesquioxanes $(\text{Cl}-\text{C}_3\text{H}_6)\text{Pr}_9-(\text{SiO}_{1.5})_{10}$ and $(\text{Cl}-\text{C}_3\text{H}_6)_9\text{Pr}(\text{SiO}_{1.5})_{10}$ show inverse ^{29}Si -NMR spectra. These decasilsesquioxanes are also characterized by their ^{29}Si -2D-INEPT-INADEQUATE-NMR spectra.

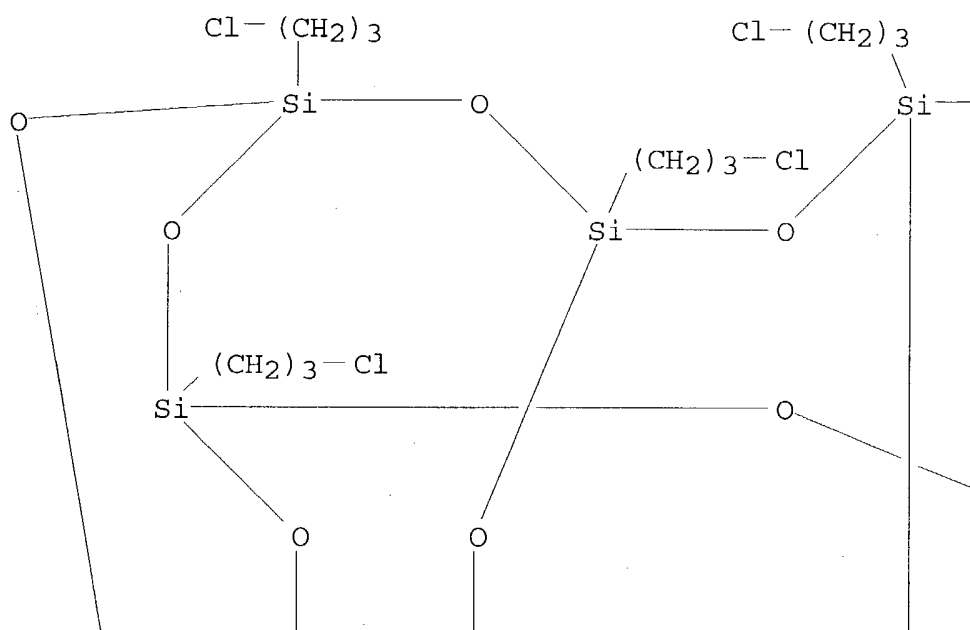
IT **292847-80-4P**

(prepn. of)

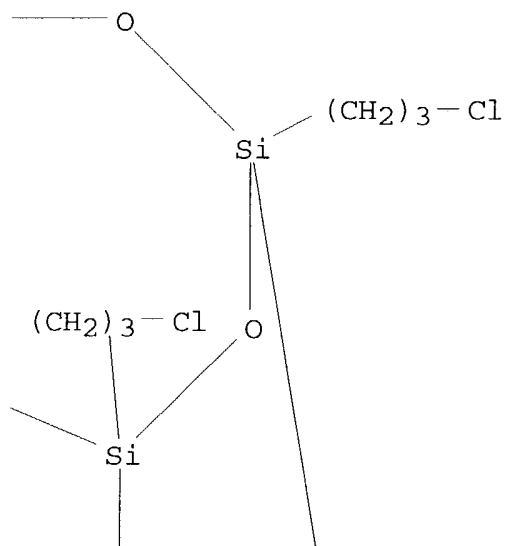
RN 292847-80-4 HCA

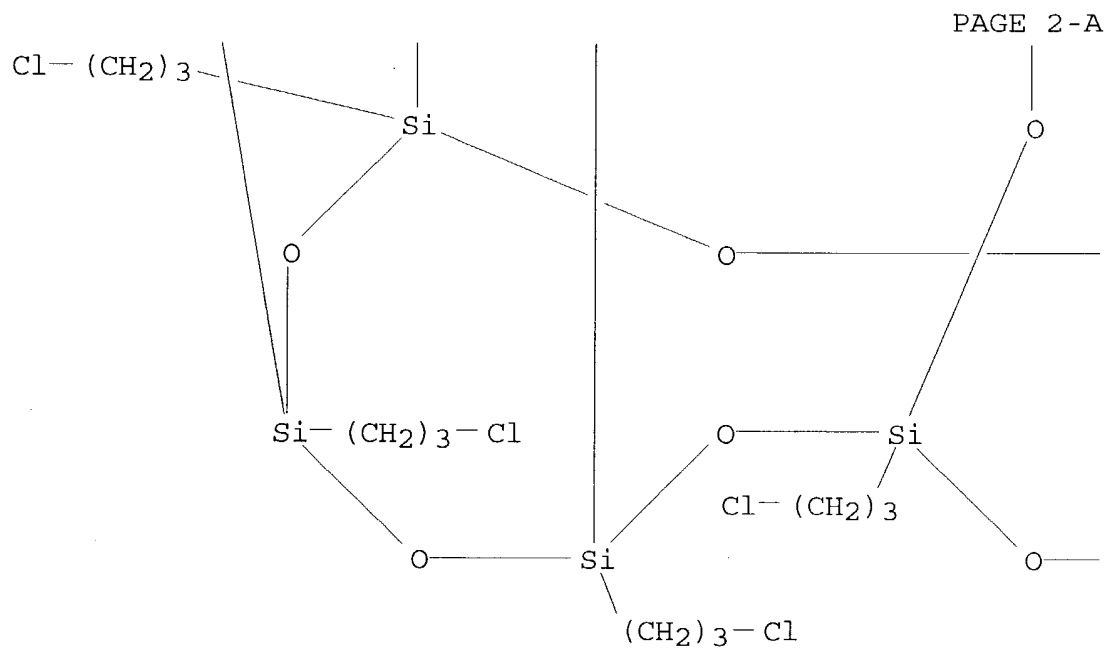
CN Heptacyclo[13.9.1.13,13.15,11.17,21.19,19.117,23]dodecasiloxane,
dodecakis(3-chloropropyl)- (9CI) (CA INDEX NAME)

PAGE 1-A

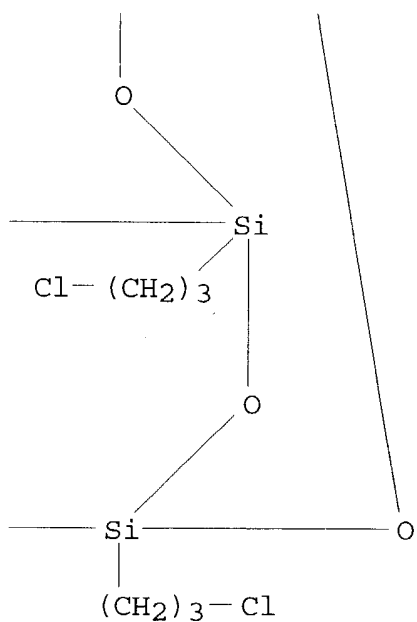


PAGE 1-B





PAGE 2-B



CC 29-14 (Organometallic and Organometalloidal Compounds)

Section cross-reference(s): 77

IT 161678-34-8P 161678-35-9P 161678-36-0P 161678-37-1P

196200-67-6P 196200-69-8P **292847-80-4P**
(prepn. of)

L43 ANSWER 8 OF 12 HCA COPYRIGHT 2003 ACS on STN

131:329934 Thermally developable material. Takamuki, Yasuhiko; Habu, Takeshi; Usagawa, Yasushi (Konica Corp., Japan). Eur. Pat. Appl. EP 952482 A1 19991027, 55 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW. APPLICATION: EP 1999-303021 19990420. PRIORITY: JP 1998-110788 19980421; JP 1998-296747 19981019; JP 1999-39888 19990218.

AB A thermally developable material is disclosed. It comprises a support, both surfaces of which are covered with a resin having a thermal shrinkage ratio of not >0.02% at 150.degree. for 30 min. and an image-forming layer comprising an org. silver compd. The thermally developable material is advantageous in that it is colorless, transparent and excellent in repetitive size accuracy.

IT **247933-43-3**

(size repetition accuracy of polyimide resin coating on thermally developable photog. material)

RN 247933-43-3 HCA

CN Heptacyclo[13.9.1.13,13.15,11.17,21.19,19.117,23]dodecasiloxane, polymer with ethynylbenzene and pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane (9CI) (CA INDEX NAME)

CM 1

CRN 536-74-3

CMF C8 H6

Ph-C \equiv CH

CM 2

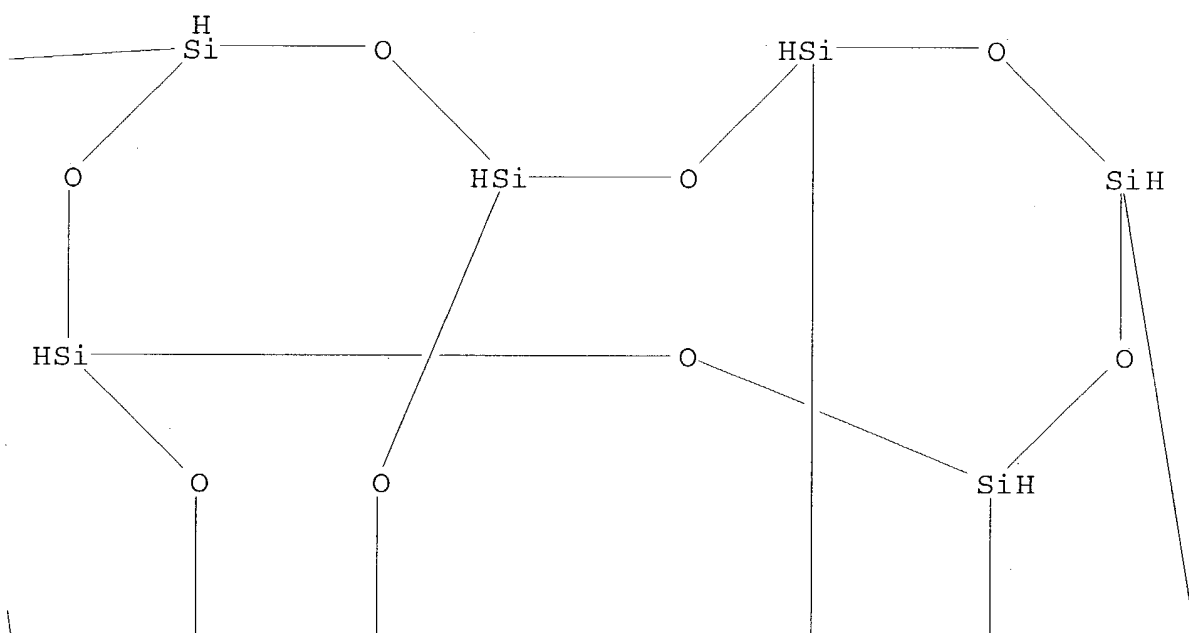
CRN 330-27-8

CMF H12 O18 Si12

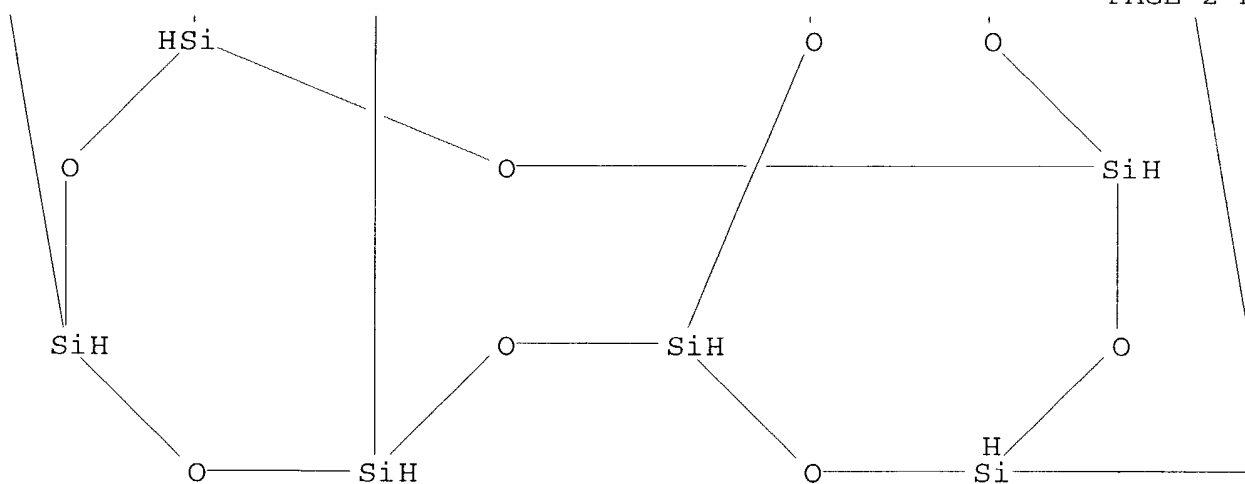
PAGE 1-A



PAGE 1-B



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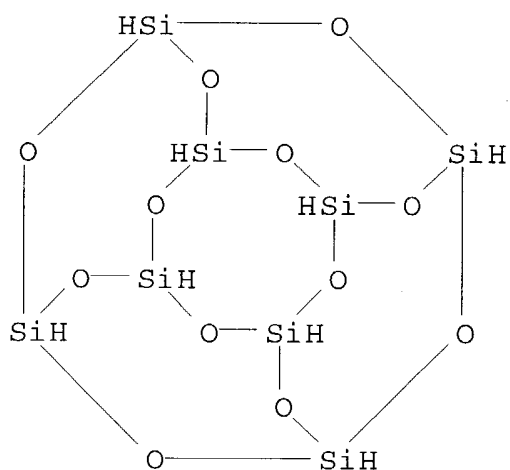


PAGE 2-C

CM 3

CRN 281-50-5

CMF H8 O12 Si8



IC ICM G03C001-498

CC 74-7 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

IT 25038-59-9, uses 26936-30-1, Methyl methacrylate-(3-trimethoxysilyl)propyl methacrylate copolymer 52224-78-9
 58374-25-7 86676-45-1 128476-43-7 134190-66-2 183291-45-4
 199869-66-4 247933-31-9 247933-32-0 247933-33-1 247933-35-3
 247933-36-4 247933-38-6 247933-40-0 247933-41-1 247933-42-2,
 Terephthalic acid-1,4-cyclohexanedimethanol-sodium
 sulfoterephthalate copolymer **247933-43-3** 247933-45-5

247933-47-7 247933-48-8

(size repetition accuracy of polyimide resin coating on thermally developable photog. material)

L43 ANSWER 9 OF 12 HCA COPYRIGHT 2003 ACS on STN

122:280696 The higher hydridospherosiloxanes: synthesis and structures of $\text{H}_n\text{Si}_n\text{O}_{1.5n}$ ($n = 12, 14, 16, 18$). Agaskar, Pradyot A.; Klemperer, Walter G. (Department of Chemistry, School of Chemical Sciences, University of Illinois at Urbana-Champaign, Urbana, IL, 61801, USA). *Inorganica Chimica Acta*, 229(1-2), 355-64 (English) 1995. CODEN: ICHAA3. ISSN: 0020-1693. Publisher: Elsevier.

AB The prepn. of the four pure compds. $\text{O}_h\text{-H}_8\text{Si}_8\text{O}_{12}$, $\text{D}_{5h}\text{-H}_{10}\text{Si}_{10}\text{O}_{15}$, $\text{D}_{2d}\text{-H}_{12}\text{Si}_{12}\text{O}_{18}$ and $\text{D}_{3h}\text{-H}_{14}\text{Si}_{14}\text{O}_{21}$ is described. These compds. were prepd. in 0.5, 3.6, 3.5 and 1.1% yields, resp., based on the starting material HSiCl_3 . The synthesis was also scaled up to make gram quantities of these compds. Preparative gas chromatog. was used to isolate mixts. of isomers of $\text{H}_{14}\text{Si}_{14}\text{O}_{21}$ and $\text{H}_{16}\text{Si}_{16}\text{O}_{24}$, from which the ^1H and ^{29}Si NMR chem. shift values of particular isomers, and in one case the x-ray crystal structure (no data), were detd. The structure of the major isomer of $\text{H}_{16}\text{Si}_{16}\text{O}_{24}$ is proposed, based on a complete enumeration of all possible isomers of this compn. that have chem. reasonable structures and the strong correlation obsd. between topol. features of the **polyhedral** structures of these compds. and $^{29}\text{Si}\{^1\text{H}\}$ NMR chem. shift values. This isomer has idealized D_{4d} symmetry, with two 4-rings and eight 5-rings arranged such that there are two sets of eight symmetry-equiv. silicon atoms.

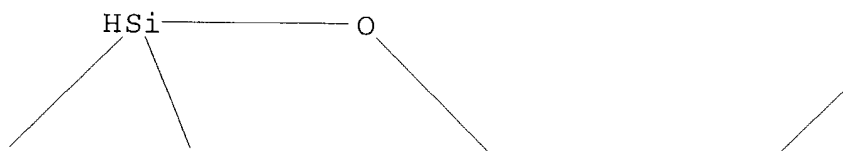
IT 330-26-7P 162658-21-1P

(prepn. and sepn. of hydridospherosiloxanes)

RN 330-26-7 HCA

CN Heptacyclo[11.11.1.1.13,11.15,21.17,19.19,17.115,23]dodecasiloxane
(8CI, 9CI) (CA INDEX NAME)

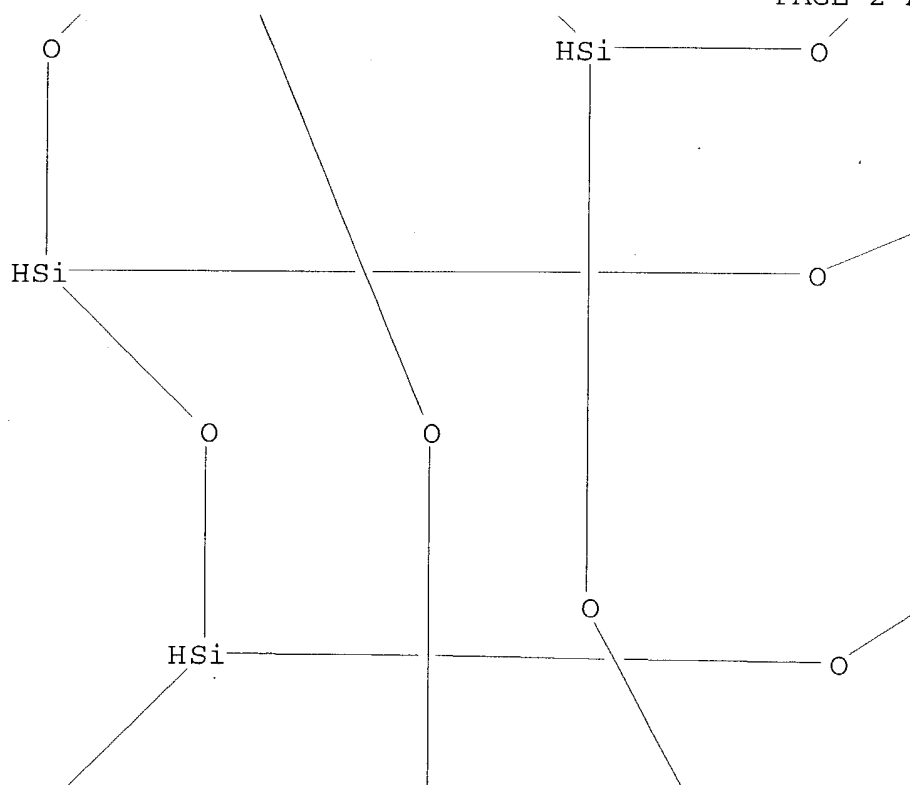
PAGE 1-A



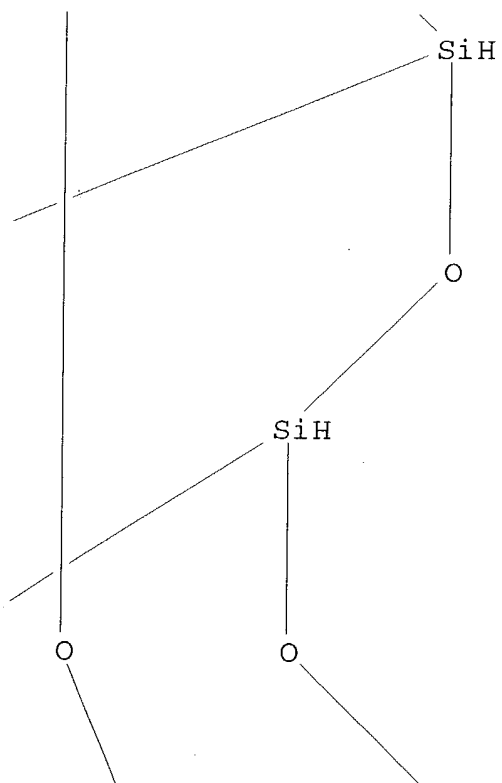
PAGE 1-B



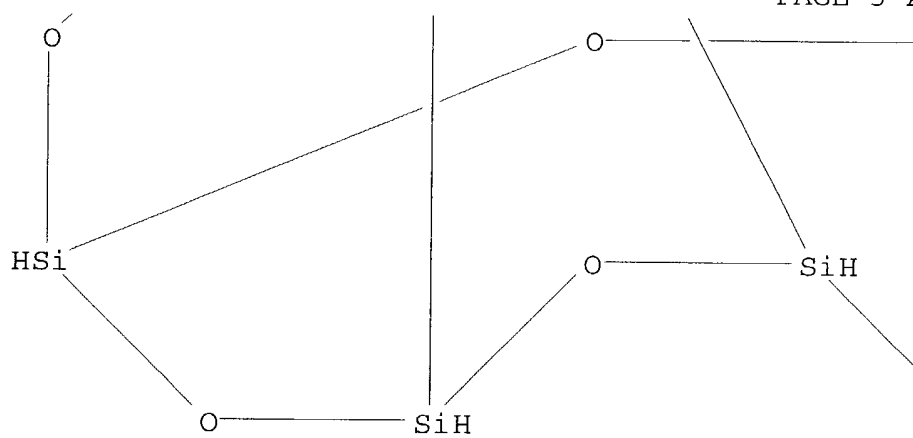
PAGE 2-A



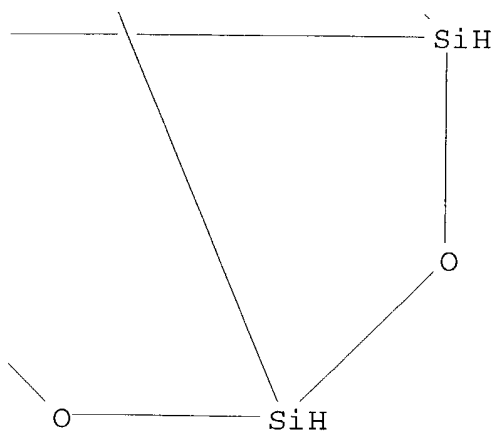
PAGE 2-B



PAGE 3-A

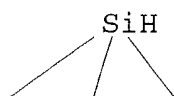


PAGE 3-B

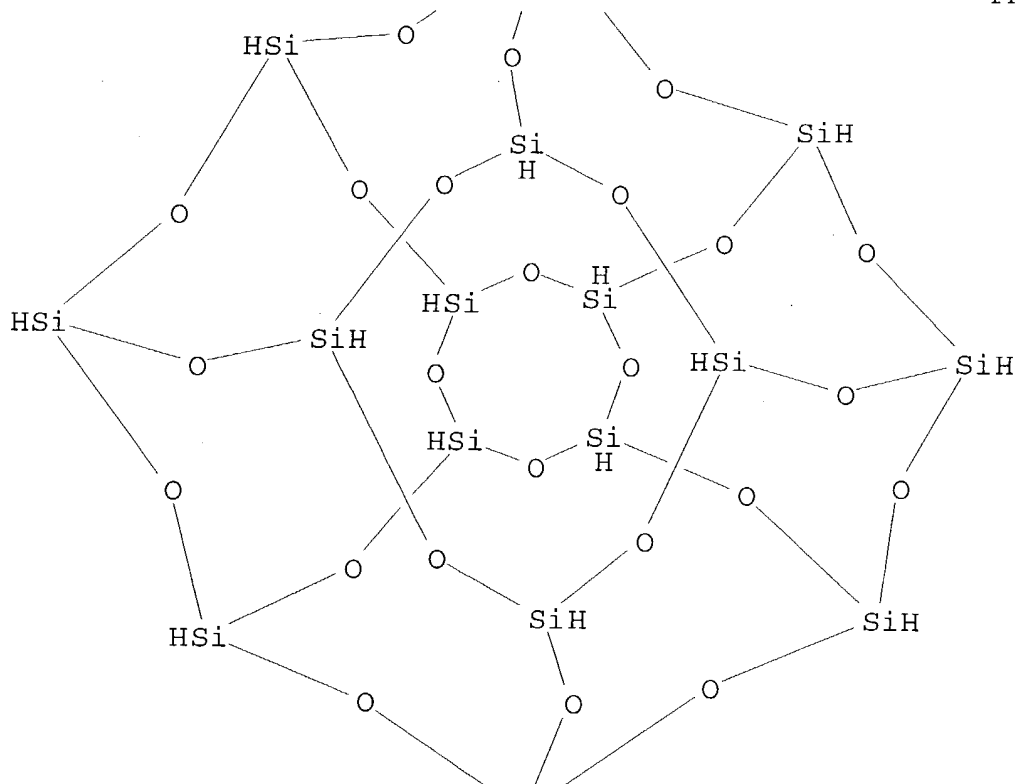


RN 162658-21-1 HCA
 CN Nonacyclo[17.13.1.13,15.15,11.17,31.19,27.113,25.117,23.121,29]hexad
 ecasiloxane (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 2-A



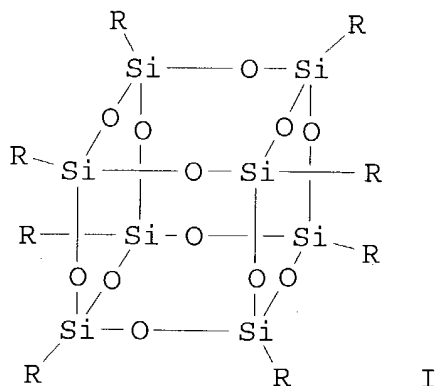
PAGE 3-A



CC 78-8 (Inorganic Chemicals and Reactions)
 IT 281-49-2P 281-50-5P 330-26-7P 109468-83-9P
 109494-91-9P 162658-21-1P
 (prepn. and sepn. of hydridospherosiloxanes)

L43 ANSWER 10 OF 12 HCA COPYRIGHT 2003 ACS on STN
 112:179082 New **polyhedral oligosilsesquioxanes** via
 the catalytic hydrogenation of aryl-containing silsesquioxanes.
 Feher, Frank J.; Budzichowski, Theodore A. (Dep. Chem., Univ.
 California, Irvine, CA, 92717, USA). Journal of Organometallic
 Chemistry, 373(2), 153-63 (English) 1989. CODEN: JORCAI. ISSN:
 0022-328X. OTHER SOURCES: CASREACT 112:179082.

GI



AB The hydrolytic condensation of RSiCl_3 ($\text{R} = \text{benzyl, m-tolyl, 3,5-dimethylphenyl}$) gives good yields of the corresponding octameric aryl silsesquioxanes (I). A single-crystal x-ray diffraction study of highly sol. I ($\text{R} = \text{benzyl}$) reveals that highly efficient crystal packing can be accomplished without the inclusion of solvent or the strong intermol. π -stacking arrangements that normally lead to poor soly. properties. The catalytic hydrogenation of aryl **polyhedral oligosilsesquioxanes** (POSS) affords high yields of the corresponding aliph. silsesquioxanes. These new silsesquioxanes display thermal and phys. properties comparable to the corresponding aryl-contg. POSS but generally have much greater solubilities in common org. solvents. The catalytic hydrogenation of $[\text{Ph}_{12}\text{Si}_{12}\text{O}_{20}]$ affords iso- $[\text{Cy}_{12}\text{Si}_{12}\text{O}_{20}]$ ($\text{Cy} = \text{cyclohexyl}$) which possesses local C_{2v} rather than D_{6h} symmetry.

IT 18923-59-6

(hydrogenation of)

RN 18923-59-6 HCA

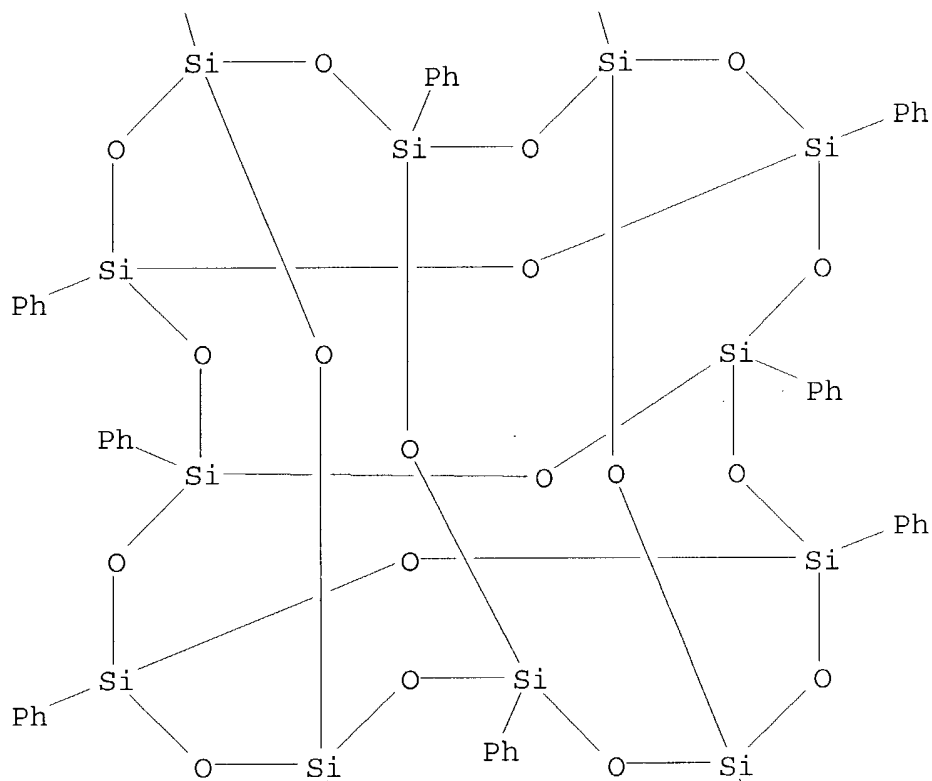
CN Heptacyclo[11.11.1.13,11.15,21.17,19.19,17.115,23]dodecasiloxane, dodecaphenyl- (7CI, 8CI, 9CI) (CA INDEX NAME)

PAGE 1-A

Ph
|

Ph
|

PAGE 2-A



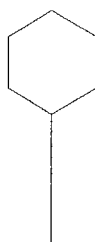
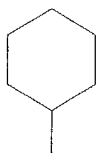
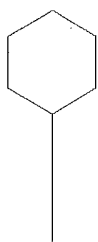
PAGE 3-A

Ph

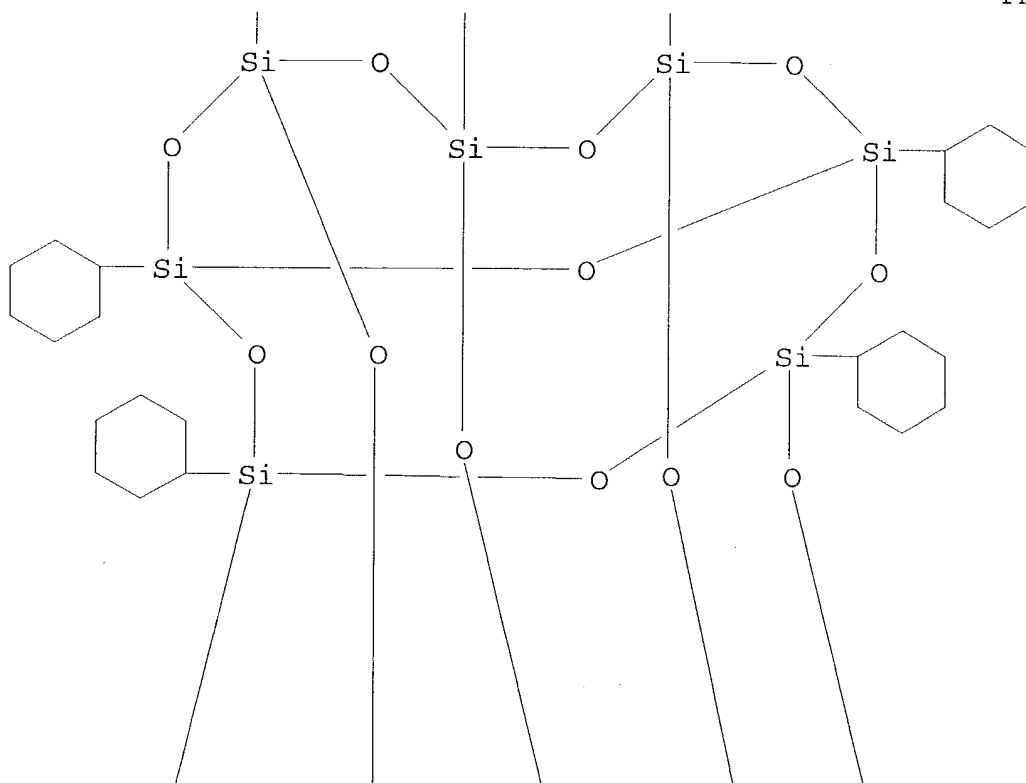
Ph

IT 126362-07-0P
(prepn. of)
RN 126362-07-0 HCA
CN Heptacyclo[11.11.1.13,11.15,21.17,19.19,17.115,23]dodecasiloxane,
dodecacyclohexyl- (9CI) (CA INDEX NAME)

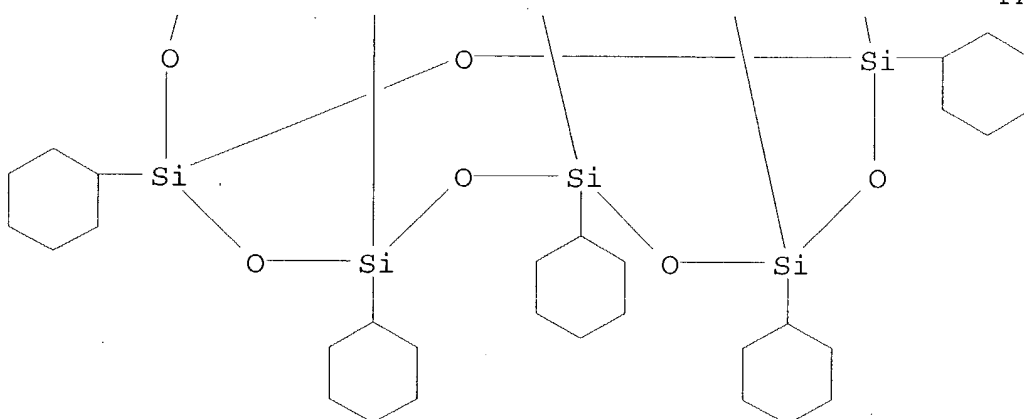
PAGE 1-A



PAGE 2-A



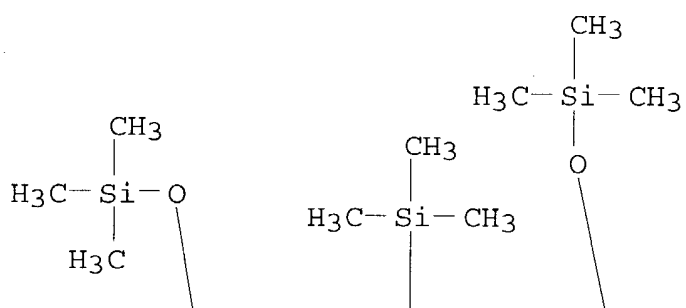
PAGE 3-A



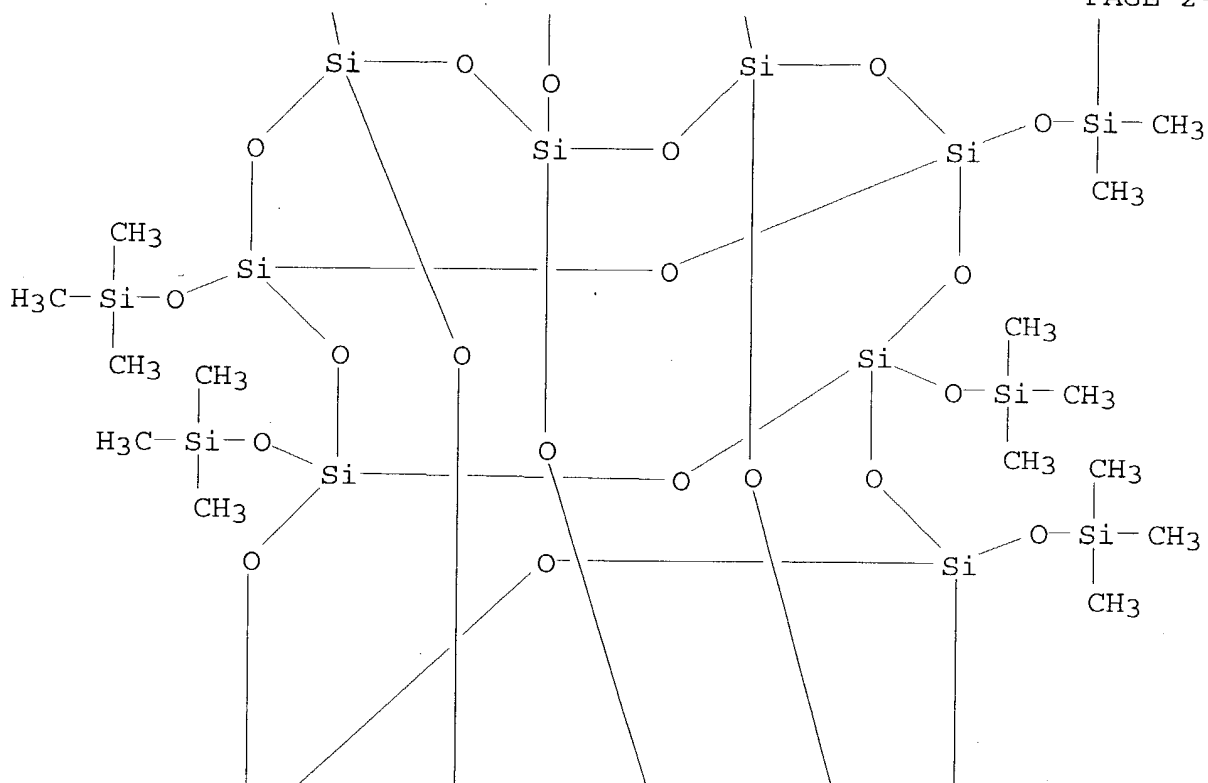
CC 29-6 (Organometallic and Organometalloidal Compounds)
Section cross-reference(s): 75
ST **oligosilsesquioxane polyhedral**; hydrogenation
aryl silsesquioxane; crystal structure benzyl silsesquioxane; mol

- structure benzyl silsesquioxane
- IT **Silsesquioxanes**
(polyhedral oligo-, prepn. and hydrogenation of)
- IT 5256-79-1 **18923-59-6** 19086-33-0
(hydrogenation of)
- IT 3809-28-7P 126362-04-7P 126362-05-8P 126362-06-9P
126362-07-0P 126362-08-1P
(prepn. of)
- L43 ANSWER 11 OF 12 HCA COPYRIGHT 2003 ACS on STN
- 107:115635 A new route to trimethylsilylated sphaerosilicates. Synthesis and structure of [Si12O18](OSiMe3)12, D3h-[Si14O21](OSiMe3)14, and C2v-[Si14O21](OSiMe3)14. Agaskar, P. A.; Day, V. W.; Klemperer, W. G. (Dep. Chem., Univ. Illinois, Urbana, IL, 61801, USA). Journal of the American Chemical Society, 109(18), 5554-6 (English) 1987. CODEN: JACSAT. ISSN: 0002-7863. OTHER SOURCES: CASREACT 107:115635.
- AB Three hydridosiloxanes were isolated for the first time from a mixt. of species (HSiO1.5)n prepd. by a method previously described by Frye and Collins: [Si12O18]H12 (I), D3h-[Si14O21]H14 (II), and C2v-[Si14O21]H14 (III). The corresponding trimethylsiloxo compds. [Si12O18](OSiMe3)12 (IV), D3h-[Si14O21](OSiMe3)14 (V), and C2v-[Si14O21](OSiMe3)14 (VI) were prepd. by treatment of I-III with Me3NOSiMe3Cl. The structures of II and III were detd. using single crystal x-ray diffraction and NMR techniques. Compds. I and IV have D2d **polyhedral** frameworks involving four four-Si siloxane rings and four five-Si siloxane rings, i.e., [44, 54] cages. Compds. II and V have **polyhedral** D3h-[43, 56] frameworks, while III and VI have C2v-[44, 54, 61] frameworks.
- IT **109468-84-0P**
(prepn. and silicon-29 NMR of)
- RN 109468-84-0 HCA
- CN Heptacyclo[11.11.1.13,11.15,21.17,19.19,17.115,23]dodecasiloxane, dodecakis[(trimethylsilyl)oxy]- (9CI) (CA INDEX NAME)

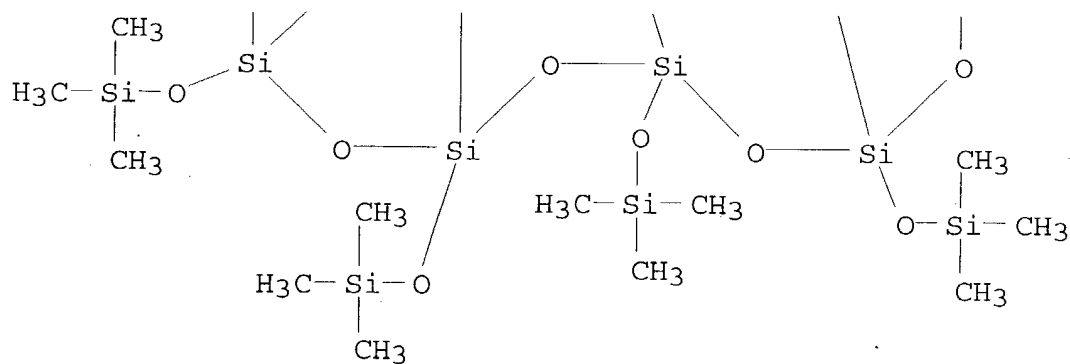
PAGE 1-A



PAGE 2-A

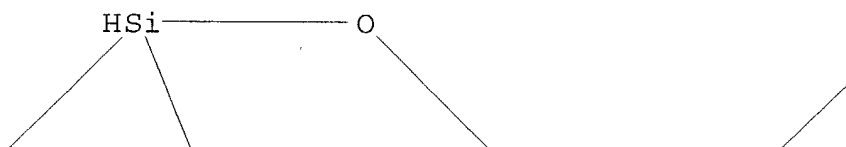


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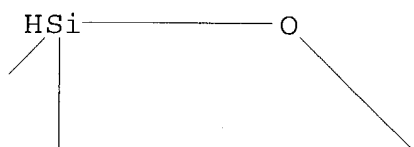


IT 330-26-7P
 (prepn., silicon-29 NMR and trimethylsiloxylation of)
 RN 330-26-7 HCA
 CN Heptacyclo[11.11.1.13,11.15,21.17,19.19,17.115,23]dodecasiloxane
 (8CI, 9CI) (CA INDEX NAME)

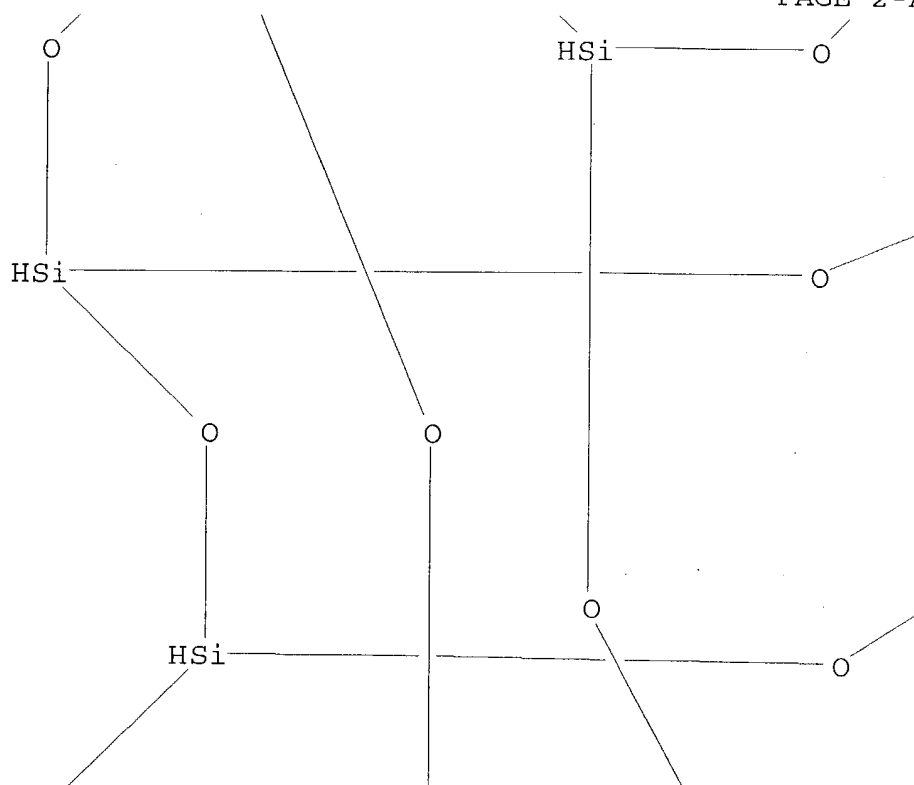
PAGE 1-A



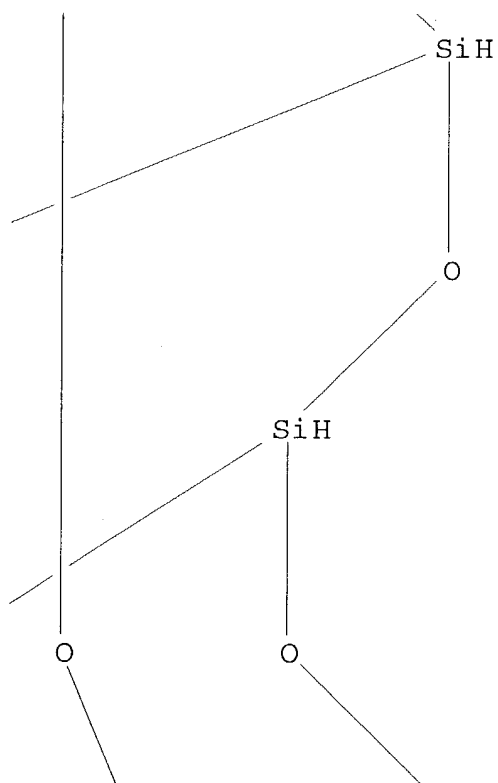
PAGE 1-B



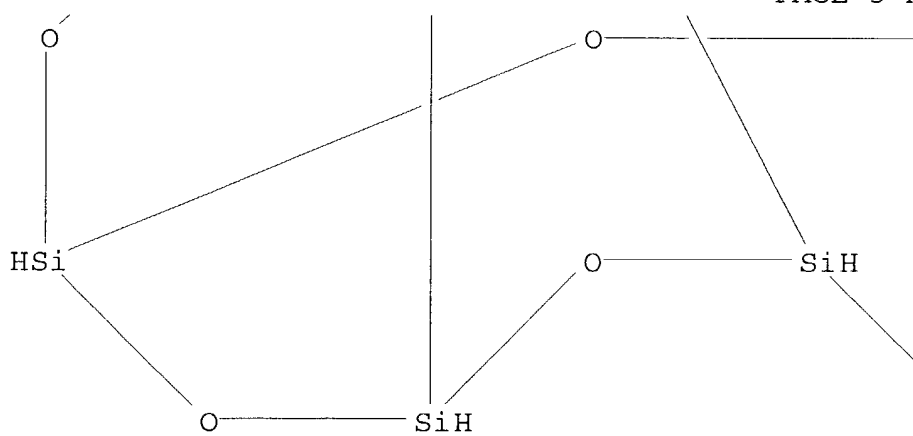
PAGE 2-A



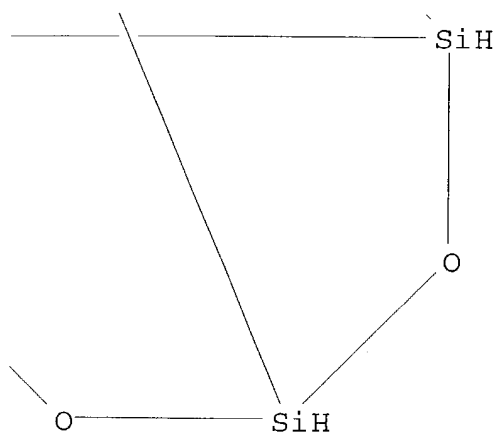
PAGE 2-B



PAGE 3-A



PAGE 3-B



CC 29-6 (Organometallic and Organometalloidal Compounds)

Section cross-reference(s): 75

IT **109468-84-0P** 109468-85-1P 109494-92-0P
(prepn. and silicon-29 NMR of)

IT **330-26-7P**
(prepn., silicon-29 NMR and trimethylsiloxylation of)

L43 ANSWER 12 OF 12 HCA COPYRIGHT 2003 ACS on STN

97:55875 Synthesis and properties of oligoalkylsilsesquioxanes with large aliphatic radicals and end trimethylsiloxy groups. Izmailov, B. A.; Zhdanov, A. A. (Inst. Elementoorg. Soedin. im. Nesmeyanova, Moscow, USSR). Zhurnal Obshchei Khimii, 52(3), 642-6 (Russian) 1982. CODEN: ZOKHA4. ISSN: 0044-460X.

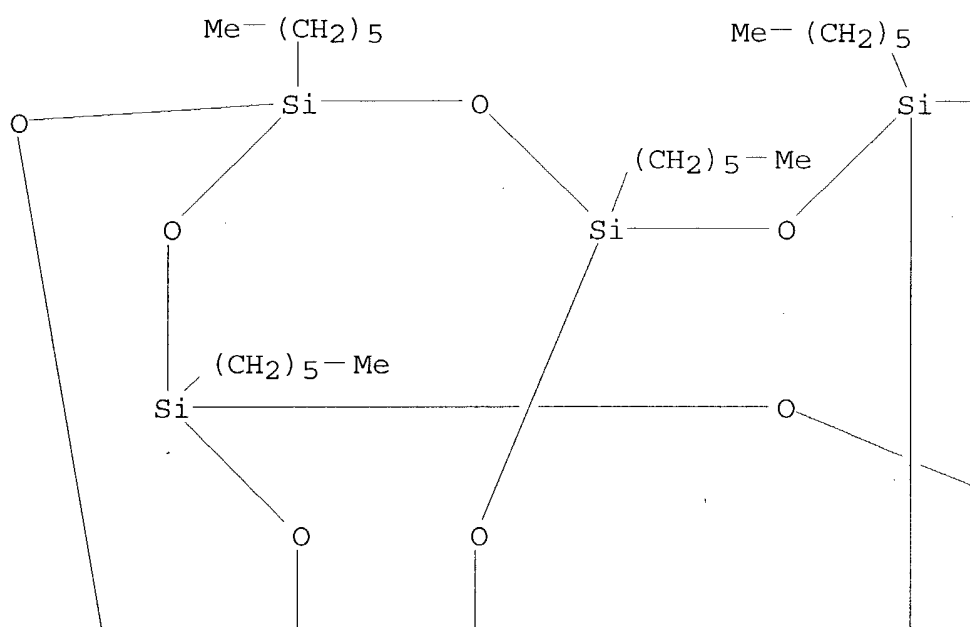
AB [RSi(OSiMe3)O]8 (R = hexyl, isononyl) and [RSiO1.5.cntdot.R1SiO1.5.cntdot.(RSi(OSiMe3O)2]2 (R = Bu, R1 = isononyl; R = R1 = hexyl; R = isononyl, R1 = Bu, isononyl), useful as lubricants, were prepd. by treatment of [RSi(OK)O]8 or [RSiO1.5.cntdot.R1SiO1.5.cntdot.(RSi(OK)O)2]2, resp., with Me3SiCl. An addnl. 26 K salts of silsesquioxanes were obtained.

IT **82513-21-1**
(conversion of, to potassium salt)

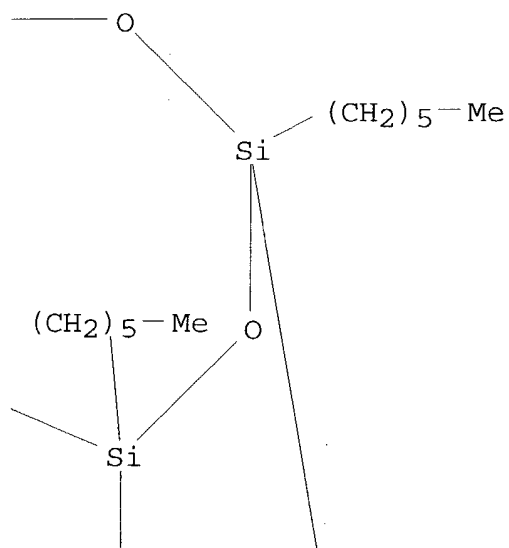
RN 82513-21-1 HCA

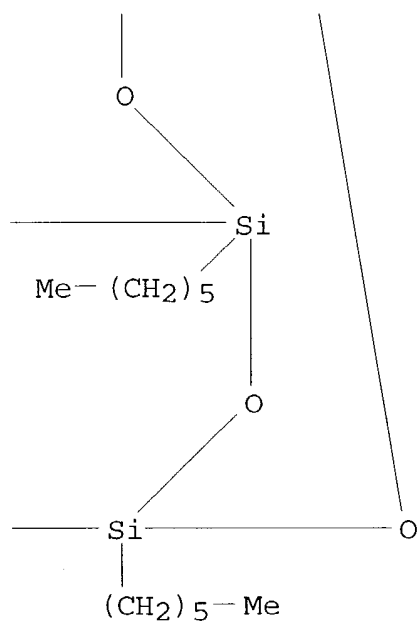
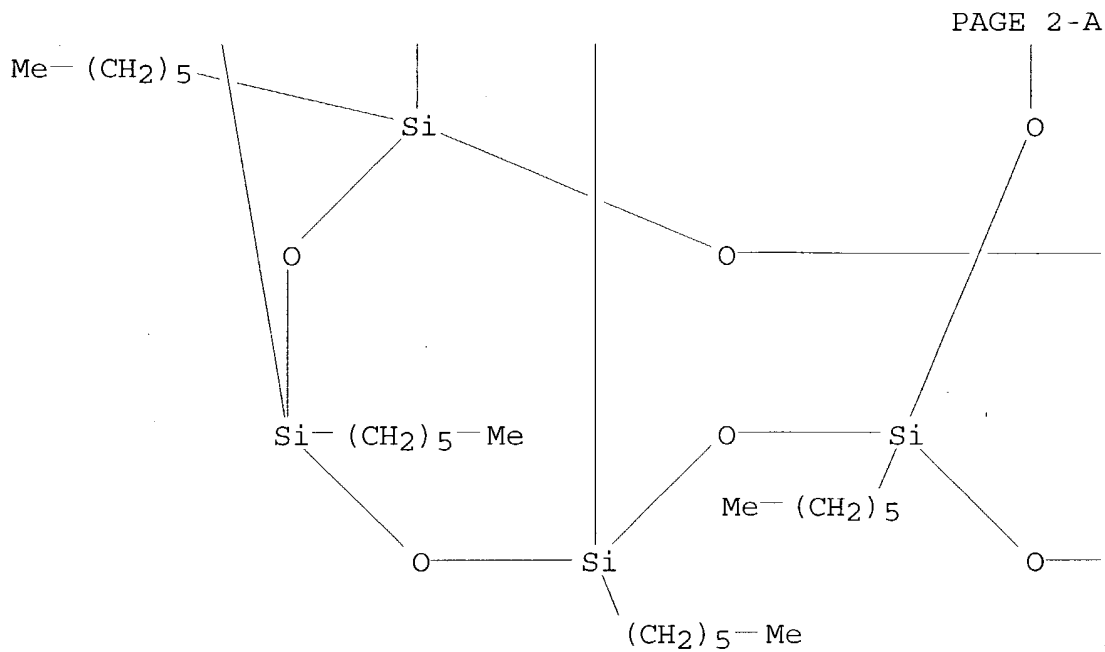
CN Heptacyclo[13.9.1.13,13.15,11.17,21.19,19.117,23]dodecasiloxane, dodecahexyl- (9CI) (CA INDEX NAME)

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CC 29-6 (Organometallic and Organometalloidal Compounds)
 Section cross-reference(s): 51
 ST **oligosilsesquioxane** trimethylsiloxo; lubricant

silsesquioxane

IT 5707-32-4 5707-33-5 5821-15-8 6017-94-3 6059-12-7
 7414-55-3 28986-83-6 29349-96-0 29382-87-4 **82513-21-1**
 (conversion of, to potassium salt)

=> d his l51-

FILE 'HCA' ENTERED AT 13:41:18 ON 17 SEP 2003

L51 87091 S LITHO? OR PHOTOLITHO? OR CHROMOLITHO? OR PHOTOCHROMOLIT
 L52 1 S L50 AND L51
 L53 0 S L25 AND L51
 L54 19 S L33 AND L51
 L55 141711 S RESIST OR RESISTS OR PHOTORESIST? OR MASK? OR PHOTOMASK
 L56 0 S L25 AND L55
 L57 25 S L33 AND L55
 L58 17 S L54 AND L57
 L59 1 S (L48 OR L52) NOT L43
 L60 16 S L58 NOT (L43 OR L59)
 L61 9 S L60 NOT (L44 OR L45 OR L46)

=> d l59 1 cbib abs hitstr hitind

L59 ANSWER 1 OF 1 HCA COPYRIGHT 2003 ACS on STN

138:311424 Evaluation of siloxane and **polyhedral** silsesquioxane copolymers for 157 nm **lithography**. Bellas, V.; Tegou, E.; Raptis, I.; Gogolides, E.; Argitis, P.; Iatrou, H.; Hadjichristidis, N.; Sarantopoulou, E.; Cefalas, A. C. (Institute of Microelectronics, NCSR Demokritos, Aghia Paraskevi, 15310, Greece). Journal of Vacuum Science & Technology, B: Microelectronics and Nanometer Structures, 20(6), 2902-2908 (English) 2002. CODEN: JVTBD9. ISSN: 0734-211X. Publisher: American Institute of Physics. *

AB Siloxane and silsesquioxane copolymers have been synthesized and first evaluated as potential components of 157 nm resist materials. In block copolymers of dimethylsiloxane and tert-Bu methacrylate neg. imaging chem. dominates at 157 nm, due to the presence of the siloxane component, although pos. imaging in aq. base developers via chem. amplification was obtained at longer wavelengths (248 nm). The same behavior is obsd. in graft copolymers of dimethylsiloxane and tert-Bu methacrylate. On the other hand, random copolymers of polymerizable **polyhedral oligomeric silsesquioxane** monomers with various acrylates, including partially fluorinated, can be used as components of resist formulations that provide pos. imaging at 157 nm, aq. base development, and physicochem. properties which resemble those of conventional poly(meth)acrylates. Pattern transfer properties depend on the selection of the silsesquioxane component. Polymers contg. 30% or higher wt./wt. ethyl-substituted silsesquioxane cages provide the necessary etch resistance as well as low surface roughness to oxygen plasma at 100 nm film thickness, allowing bilayer 157 nm **lithog.**, even without further absorbance

optimization.

IT 302347-60-0P 509106-75-6P 509106-76-7P
 509106-77-8P 509106-78-9P

(evaluation of siloxane and **polyhedral** silsesquioxane
 copolymers for 157 nm **lithog.**)

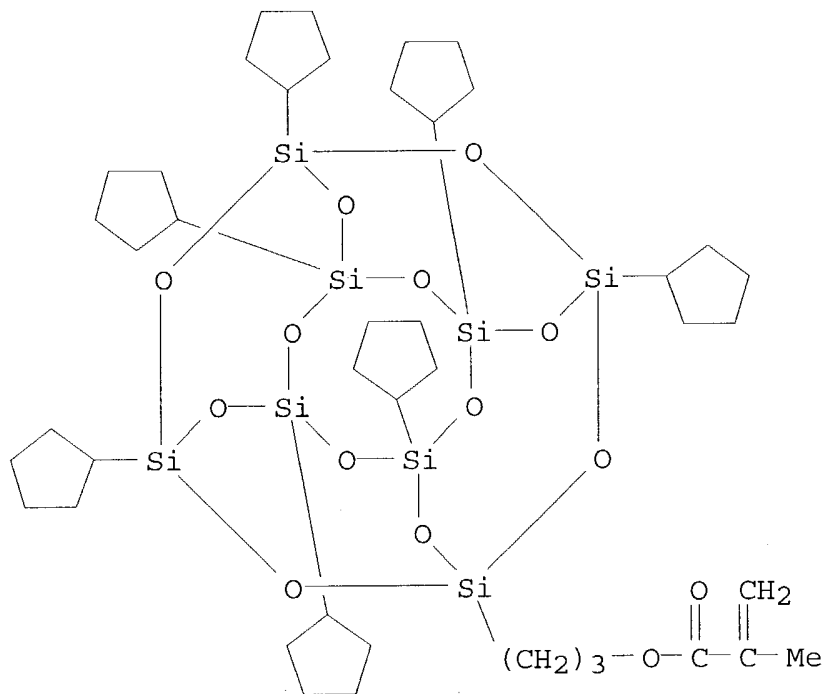
RN 302347-60-0 HCA

CN 2-Propenoic acid, 2-methyl-, 1,1-dimethylethyl ester, polymer with
 3-(heptacyclopentylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)p
 ropyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 169391-91-7

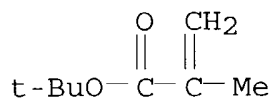
CMF C42 H74 O14 Si8



CM 2

CRN 585-07-9

CMF C8 H14 O2



RN 509106-75-6 HCA

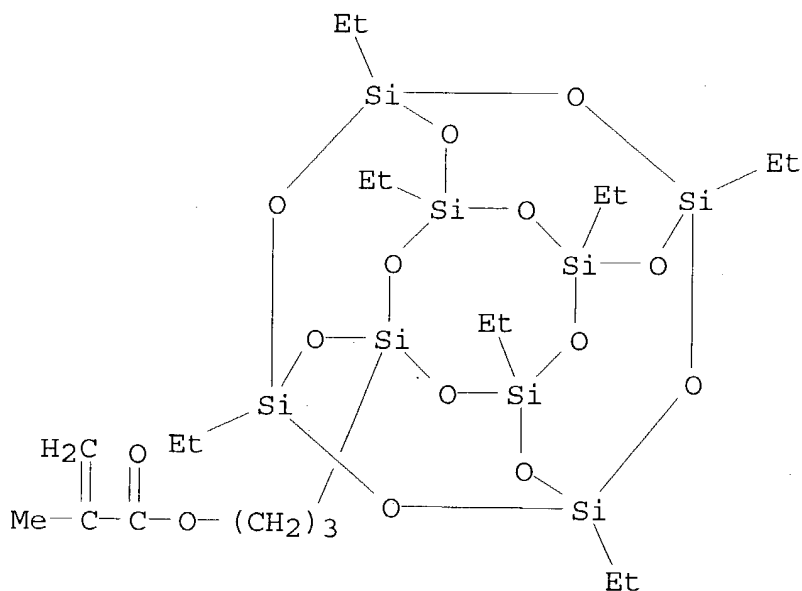
CN 2-Propenoic acid, 2-methyl-, 1,1-dimethylethyl ester, polymer with

3-(heptaethylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)propyl
2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 509106-74-5

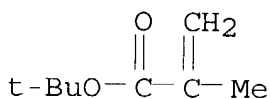
CMF C21 H46 O14 Si8



CM 2

CRN 585-07-9

CMF C8 H14 O2



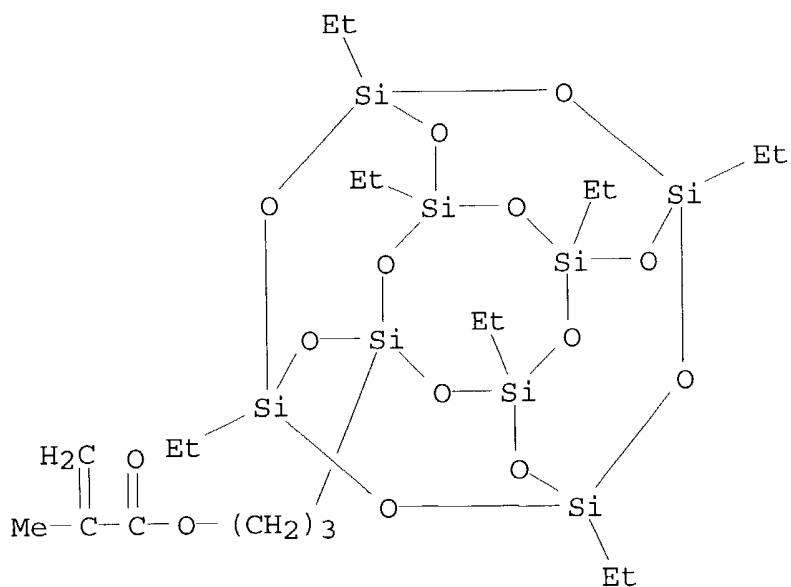
RN 509106-76-7 HCA

CN 2-Propenoic acid, 2-methyl-, 3-(heptaethylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)propyl ester, polymer with dihydro-3-methylene-2,5-furandione and methyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 509106-74-5

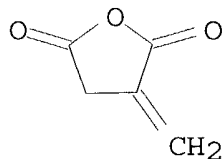
CMF C21 H46 O14 Si8



CM 2

CRN 2170-03-8

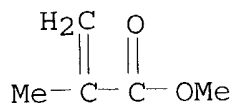
CMF C5 H4 O3



CM 3

CRN 80-62-6

CMF C5 H8 O2



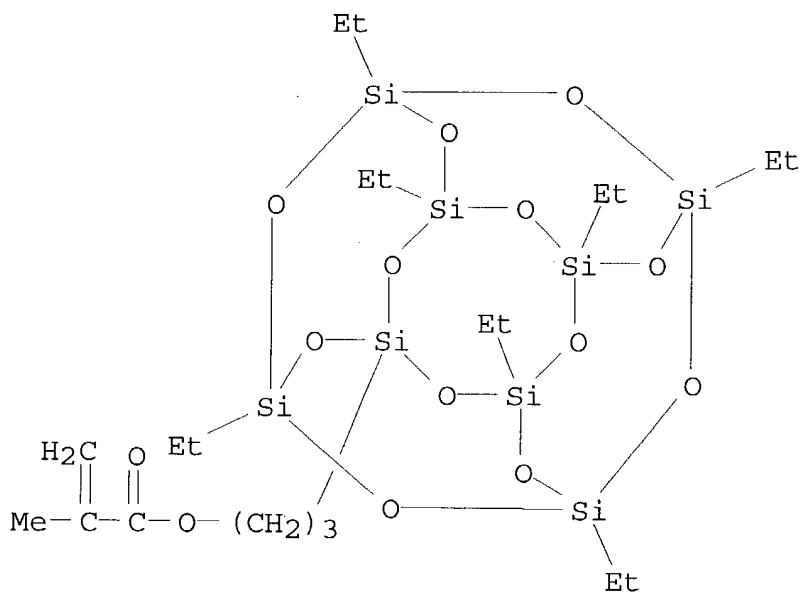
RN 509106-77-8 HCA

CN 2-Propenoic acid, 2-methyl-, 1,1-dimethylethyl ester, polymer with 3-(heptaethylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)propyl 2-methyl-2-propenoate and methyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 509106-74-5

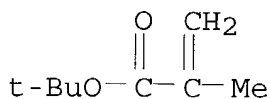
CMF C21 H46 O14 Si8



CM 2

CRN 585-07-9

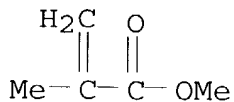
CMF C8 H14 O2



CM 3

CRN 80-62-6

CMF C5 H8 O2



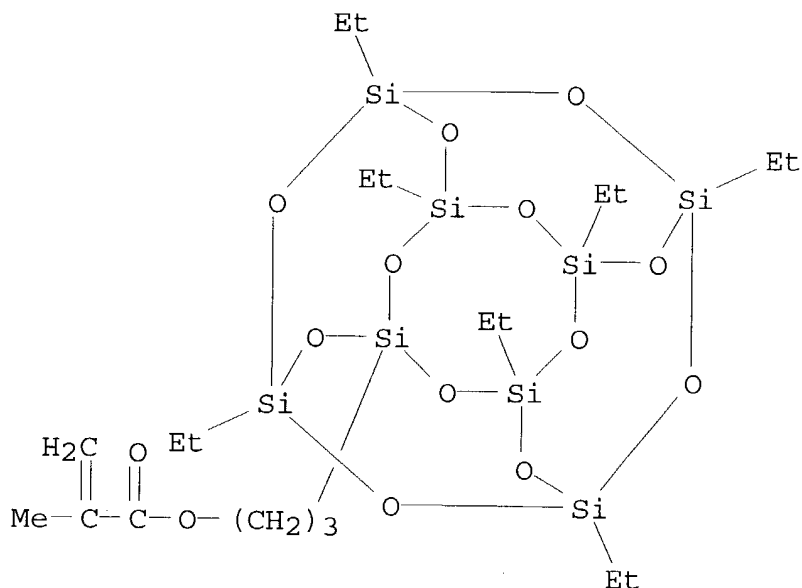
RN 509106-78-9 HCA

CN 2-Propenoic acid, 2-methyl-, 3-(heptaethylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)propyl ester, polymer with 2-(trifluoromethyl)-2-propenoic acid (9CI) (CA INDEX NAME)

CM 1

CRN 509106-74-5

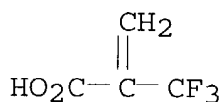
CMF C21 H46 O14 Si8




CM 2

CRN 381-98-6

CMF C4 H3 F3 O2

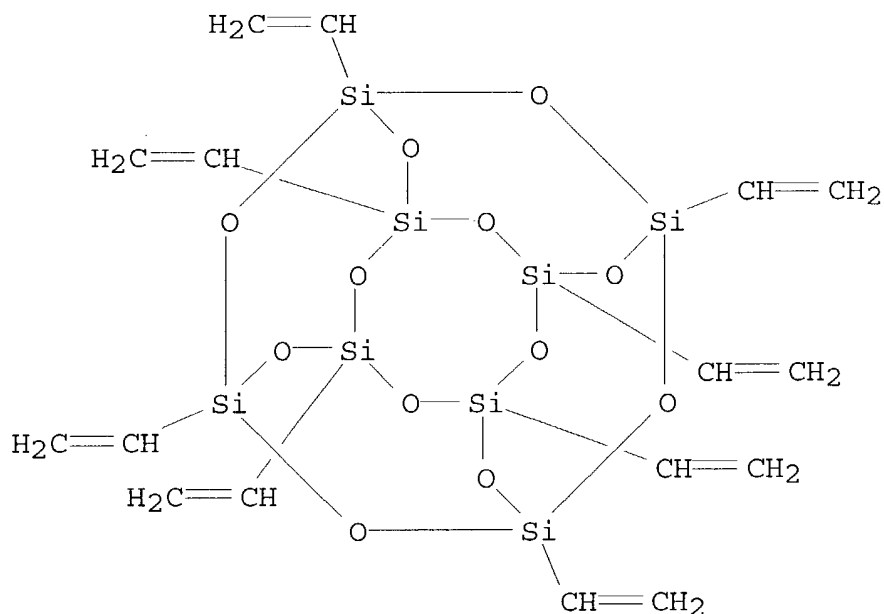


- CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
 Section cross-reference(s): 38
- ST siloxane **polyhedral** silsesquioxane copolymer polymer
photolithog UV
- IT Electron beam resists
Photolithography
 Photoresists
 Surface roughness
 (evaluation of siloxane and **polyhedral** silsesquioxane copolymers for 157 nm **lithog.**)
- IT Fluoropolymers, properties
 Polysiloxanes, properties
 Silsesquioxanes

- (evaluation of siloxane and **polyhedral** silsesquioxane copolymers for 157 nm **lithog.**)
- IT Electron beam **lithography**
(evaluation of siloxane and **polyhedral** silsesquioxane copolymers for 157 nm **lithog.** and)
- IT Etching
(resistance; evaluation of siloxane and **polyhedral** silsesquioxane copolymers for 157 nm **lithog.** in relation to etch resistance)
- IT 302347-60-0P 509106-73-4P 509106-75-6P
509106-76-7P 509106-77-8P 509106-78-9P
509108-05-8P
(evaluation of siloxane and **polyhedral** silsesquioxane copolymers for 157 nm **lithog.**)
- 

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- L61 ANSWER 1 OF 9 HCA COPYRIGHT 2003 ACS on STN
135:378651 Progress toward the fabrication of scanning near-field optical probe: pattern definition by e-beam **lithography**. Foglietti, V.; Cianci, E.; Giannini, G. (CNR, Istituto di Elettronica dello Stato Solido (IESS), Rome, 00156, Italy). Microelectronic Engineering, 57-58, 807-811 (English) 2001. CODEN: MIENEF. ISSN: 0167-9317. Publisher: Elsevier Science B.V..
- AB In this paper, the progress towards the fabrication of a tip on top of a glass fiber. is described. This paper focuses exclusively on the patterning which is defined on top of the flat end of the fiber, covered by a thin layer of chromium film that has been previously deposited. A special electron **resist** is used to transfer the circular pattern on the fiber. The **resist** consists of octavinylsilsexquioxane which is evapd. on top of the fiber by sublimation. The use of a dry **resist** allows to deposit a uniform layer on a very small area which is a very difficult task to obtain with the use of wet **resists**, which require spinning techniques, that should also be very difficult to use in the specific case of the end of an optical fiber. After development, the pattern is transferred to the chromium film underneath by wet etching. This procedure has been optimized in order to preserve the pattern resoln. obtained by means of electron beam **lithog.** The chromium film is the **mask** which will be used to perform the etching of the fiber.
- IT 69655-76-1, Octavinyl octasilsesquioxane
(neg. tone **resist**; fabrication of scanning near field optical probe using pattern definition by e-beam **lithog.**)
- RN 69655-76-1 HCA
CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octaethenyl- (9CI)
(CA INDEX NAME)



- CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 73
- ST scanning nearfield optical microscopy probe fabrication electron beam **lithog**
- IT Electron beam **lithography**
(fabrication of scanning near field optical probe using pattern definition by e-beam **lithog**.)
- IT Scanning microscopy
(near-field; fabrication of scanning near field optical probe using pattern definition by e-beam **lithog**. in relation to)
- IT 7440-47-3, Chromium, processes
(fabrication of scanning near field optical probe using pattern definition by e-beam **lithog**.)
- IT **69655-76-1**, Octavinylsiloxane
(neg. tone **resist**; fabrication of scanning near field optical probe using pattern definition by e-beam **lithog**.)

L61 ANSWER 2 OF 9 HCA COPYRIGHT 2003 ACS on STN
128:82033 The application of octvinylsiloxane as a vacuum electron **resist** for nanolithography. Litvin, L. V.; Gavrilova, T. A.; Plotnikov, A. E.; Gutakovskii, A. K.; Nastaushev, Yu. V.; Aseev, A. L.; Dul'tsev, F. N.; Mogil'nikov, K. P.; Baklanov, M. R.; Prokhorova, S. A.; Nikulina, L. D.; Volkova, S. M.; Liskovskaya, T. I.; Danilovich, V. S.; Spangenberg, B.; Altmeyer, S. (Siberian Div., Inst. Phys. Semicond., Russ. Acad. Sci., Novosibirsk, 630090, Russia). Russian Microelectronics (Translation of

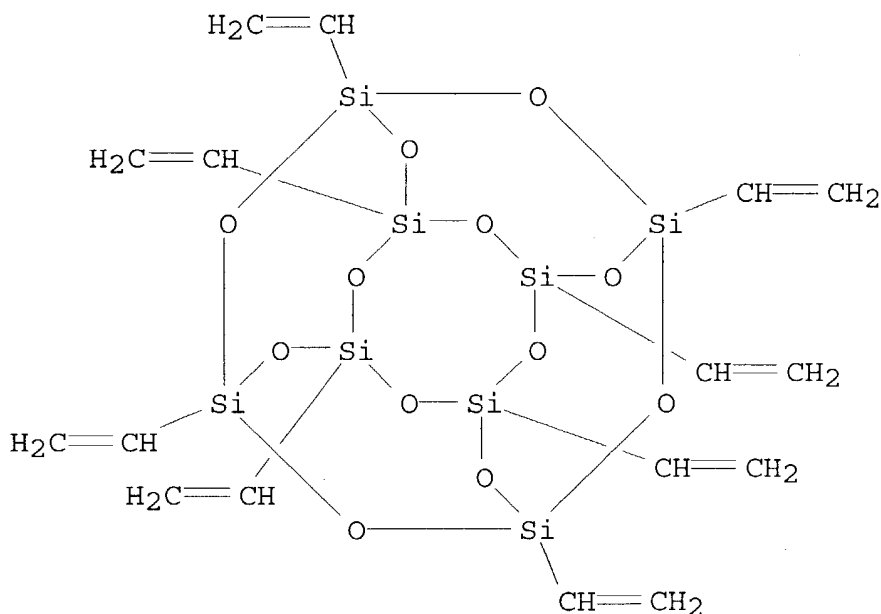
Mikroelektronika), 26(6), 387-393 (English) 1997. CODEN: RUICE5.
ISSN: 1063-7397. Publisher: MAIK Nauka/Interperiodica Publishing.

AB Continuous 50-70 nm thick films of octavinylsilsesquioxane (vinyl-T8), a vacuum neg. **resist** for electron nanolithog., were prepd. Morphol. changes upon thermal development were found in these films. An idea of the porosity of thermally developed vinyl-T8 exposed at doses between 4 and 400 $\mu\text{C}/\text{cm}^2$ on Si substrates was put forward to explain this effect. This assumption, verified exptl., gives better insight into the basic properties of octavinylsilsesquioxane, which earlier were treated only on a hypothetical basis. A new method of characterizing electron **resists** was suggested. In this method, the effective-thickness-related contrast of the **resist** exposed to various doses is measured in a transmission electron microscope. The resoln. was 20 nm for dry development and 50 nm for wet development in chloroform.

IT **69655-76-1**, Octavinylsilsesquioxane
(octvinylsilsesquioxane as vacuum electron **resist** for nanolithog.)

RN 69655-76-1 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octaethenyl- (9CI)
(CA INDEX NAME)



CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

ST octvinylsilsesquioxane electron **lithog resist**

IT Electron beam **resists**
(neg.-working; octvinylsilsesquioxane as vacuum electron **resist** for nanolithog.)

IT Refractive index

(octvinylsilsesquioxane as vacuum electron **resist** for nanolithog.)

IT Silsesquioxanes
(octvinylsilsesquioxane as vacuum electron **resist** for nanolithog.)

IT 7440-44-0, Carbon, uses
(membrane; octvinylsilsesquioxane as vacuum electron **resist** for nanolithog.)

IT 69655-76-1, Octavinyilsilsesquioxane
(octvinylsilsesquioxane as vacuum electron **resist** for nanolithog.)

L61 ANSWER 3 OF 9 HCA COPYRIGHT 2003 ACS on STN

126:270271 Evaluation of the dry **resist**

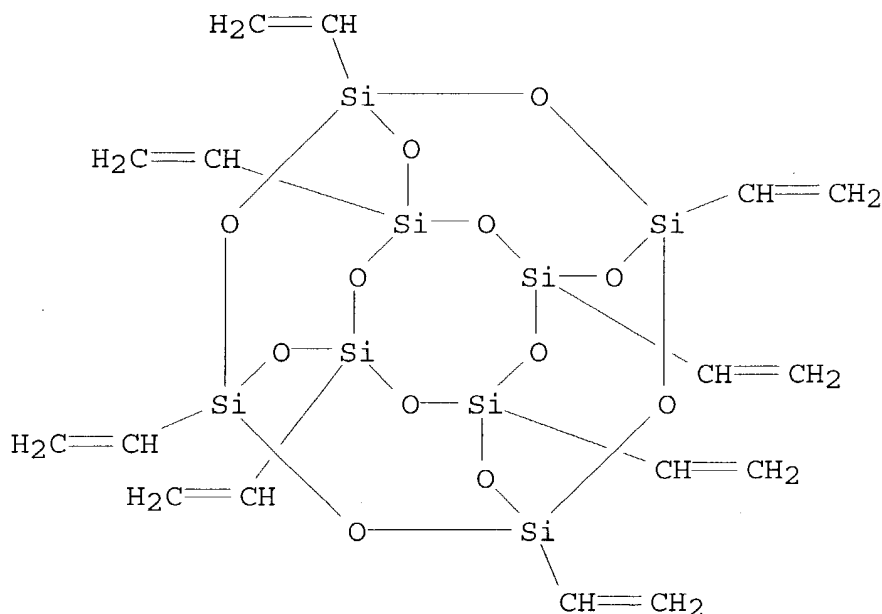
octavinyilsilsesquioxane and its application to three-dimensional electron-beam **lithography**. Koops, H. W. P.; Babin, S.; Weber, M.; Dahm, G.; Holopkin, A.; Lyakhov, M. (Deutsche Telekom AG, Technologiezentrum, Darmstadt, D-64295, Germany). Proceedings of SPIE-The International Society for Optical Engineering, 2724(Advances in Resist Technology and Processing XIII), 578-587 (English) 1996. CODEN: PSISDG. ISSN: 0277-786X. Publisher: SPIE-The International Society for Optical Engineering.

AB Structurization of three-dimensional surfaces has become more and more important for micro-mechanics, micro-electronics, and micro-optics. It is widely accepted that **resist** processes present fewer hazards to personnel and environment than conventional wet **resist** processes. Octavinyilsilsesquioxane is investigated as a dry neg. tone **resist**. It is employed to structure 250 .mu.m deep steep surface steps, to modify fabricated three-dimensional structures with dot gratings for metrol. applications, and to generate optical micro-lenses of 6 .mu.m to 150 .mu.m diam. on wafers and on the end of monomode fibers. The neg. tone dry **resist**, also known as V-T8, enables coating process of arbitrary substrates by evapn. in high vacuum. After exposure it is developed in high vacuum by a dry thermal treatment at 200 .degree.C. The **resist** is characterized using layers with a thickness in the range from 50 nm to 1 .mu.m. Electrons with an energy ranging from 5 keV to 50 keV are used. The sensitivity of V-T8 films is 40 .mu.C/cm2 at 20 keV; which is orders of magnitude higher than that of other dry **resist** systems. The **resist** exhibits high dry etch resistivity. Its contrast is increased from 0.7 to 2.1 using plasma etching in CF4 as a post-development step.

IT 69655-76-1, Octavinyilsilsesquioxane
(evaluation of the dry **resist** octavinyilsilsesquioxane and its application to three-dimensional electron-beam **lithog**.)

RN 69655-76-1 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octaethenyl- (9CI)
(CA INDEX NAME)



- CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
- ST dry **resist** octavinylsilsesquioxane evaluation; electron beam **lithog** dry **resist** octavinylsilsesquioxane; three dimensional structure electron beam **lithog**
- IT Electron beam **lithography**
(dry; evaluation of the dry **resist** octavinylsilsesquioxan and its application to three-dimensional electron-beam **lithog**.)
- IT Negative **photoresists**
(evaluation of the dry **resist** octavinylsilsesquioxan and its application to three-dimensional electron-beam **lithog**.)
- IT Silsesquioxanes
(evaluation of the dry **resist** octavinylsilsesquioxan and its application to three-dimensional electron-beam **lithog**.)
- IT Lenses
(manuf. using dry **resist** octavinylsilsesquioxan)
- IT Etching
(plasma; as post-treatment for increasing **photoresist** contrast)
- IT Etching **masks**
(using dry **resist** octavinylsilsesquioxan)
- IT 69655-76-1, Octavinylsilsesquioxane
(evaluation of the dry **resist** octavinylsilsesquioxan and its application to three-dimensional electron-beam **lithog**.)

L61 ANSWER 4 OF 9 HCA COPYRIGHT 2003 ACS on STN

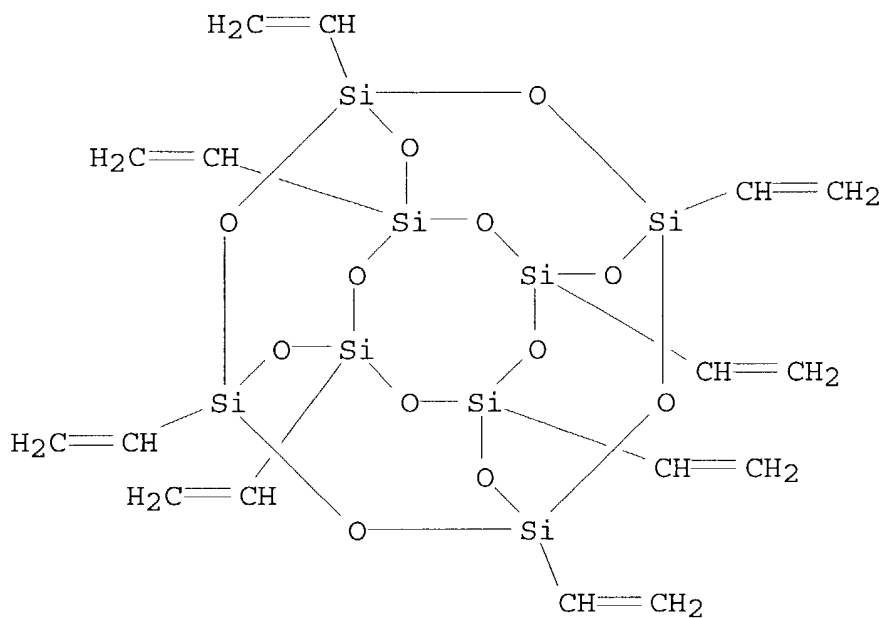
126:256969 Comparative study of the characteristics of octavinylsilsesquioxane dry **resist** in ultraviolet-, electron-beam and x-ray exposure. Schmidt, A.; Babin, S.; Boehmer, K.; Koops, H. W. P. (Deutsche Telekom AG, Technologiezentrum, Am Kavalleriesand 3, Darmstadt, 64295, Germany). Microelectronic Engineering, 35(1-4, Micro- and Nano-Engineering 96), 129-132 (English) 1997. CODEN: MIENEF. ISSN: 0167-9317. Publisher: Elsevier.

AB Fabrication techniques in microelectronics as well as in micro mechanics, micro optics and micro fluidics favor the application of a dry **resist** process due to environmental protection and reproducibility in the processing. The applicability of the dry, neg. tone **resist** using octavinylsilsesquioxane as a monomer unit is investigated by three different **lithogs**. Deep UV-**lithog**. with excimer laser radiation, electron-beam, and x-ray **lithog**. with synchrotron radiation is employed to measure the characteristics of this **resist**. For deep UV-**lithog**., the **resist** shows ablation which means a pos. action as well as polymn. for neg. action depending on the wavelength and the fluence range applied. Under electron beam and X-ray exposure the material acts as a neg. tone **resist** with high sensitivity and spatial resolu. The characteristic curves of the **resist** using the three **lithogs**. are presented.

IT 69655-76-1, Octavinylsilsesquioxane
(V-T 8; comparative study of the characteristics of octavinylsilsesquioxane dry **resist** in UV-, electron-beam and x-ray exposure)

RN 69655-76-1 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octaethenyl- (9CI)
(CA INDEX NAME)



IT 188356-58-3

(comparative study of the characteristics of
octavinylsilsesquioxane dry **resist** in UV-,
electron-beam and x-ray exposure)

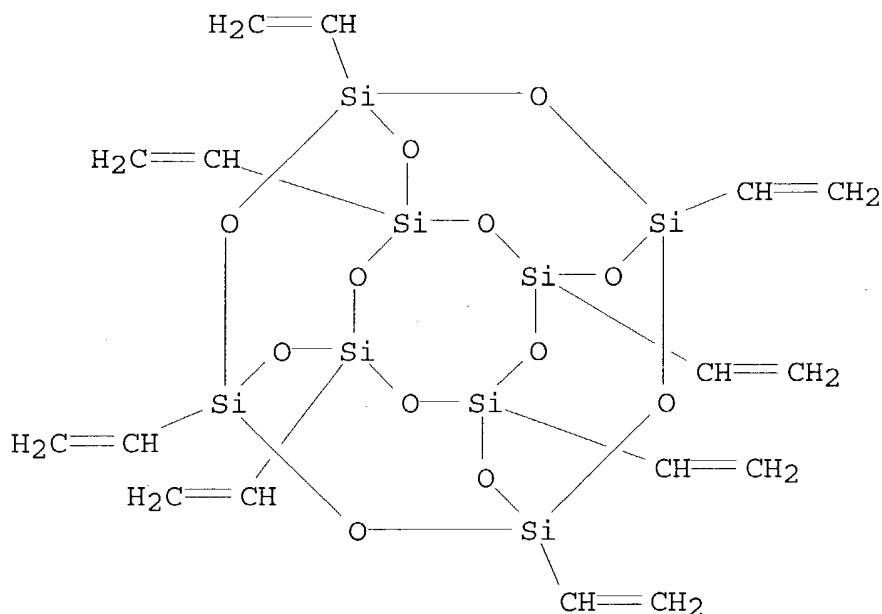
RN 188356-58-3 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octaethenyl-,
homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 69655-76-1

CMF C16 H24 O12 Si8



CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

Section cross-reference(s): 37, 76

ST electron beam **lithog** octavinylsilsesquioxane dry **resist**; deep UV **lithog** octavinylsilsesquioxane dry **resist**; excimer laser **lithog** octavinylsilsesquioxane dry **resist**

IT **Lithography**
Photoresists

(comparative study of the characteristics of octavinylsilsesquioxane dry **resist** in UV-, electron-beam and x-ray exposure)

IT 69655-76-1, Octavinylsilsesquioxane (V-T 8; comparative study of the characteristics of octavinylsilsesquioxane dry **resist** in UV-, electron-beam and x-ray exposure)

IT 188356-58-3 (comparative study of the characteristics of octavinylsilsesquioxane dry **resist** in UV-, electron-beam and x-ray exposure)

L61 ANSWER 5 OF 9 HCA COPYRIGHT 2003 ACS on STN

126:231340 Methods for fabricating polymer films with three-dimensional structure for integrated optics. Koops, Hans W. P.; Babin, Sergey (Deutsche Telekom Ag, Germany). Ger. Offen. DE 19630705 A1 19970320, 4 pp. (German). CODEN: GWXXBX. APPLICATION: DE 1996-19630705 19960730. PRIORITY: DE 1995-19531860 19950830.

AB The title methods entail forming a layer of a dry **resist** which is polymerizable by irradiation (with light or ionizing radiation)

on a support, irradiating the layer with a spatially and temporally specific dose by scanning with submicron precision in the desired pattern, and subsequently removing the resulting polymd. structure (e.g., a lens) from the unpolymd. dry **resist** using a dry process.

IT 188356-58-3

(dry methods for fabricating polymer films with three-dimensional structure for integrated optics)

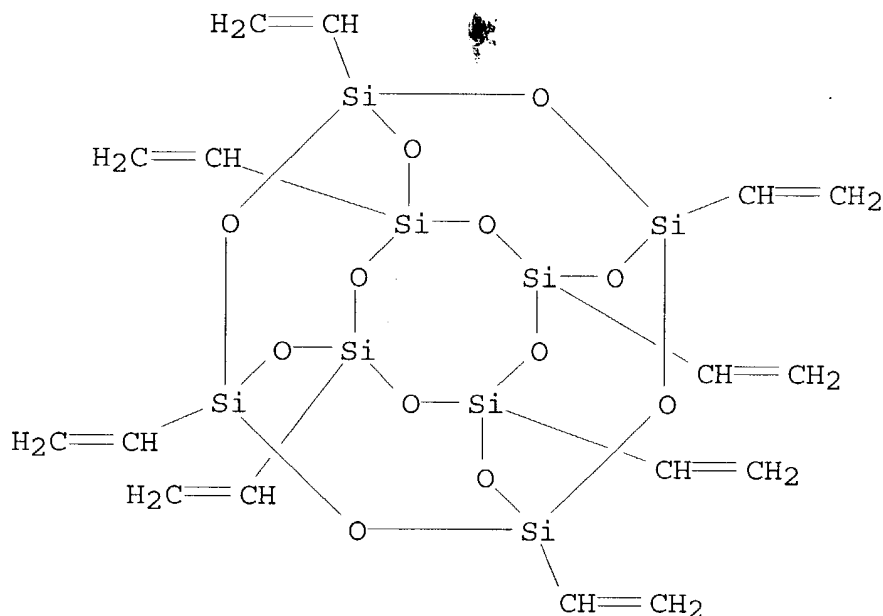
RN 188356-58-3 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octaethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 69655-76-1

CMF C16 H24 O12 Si8

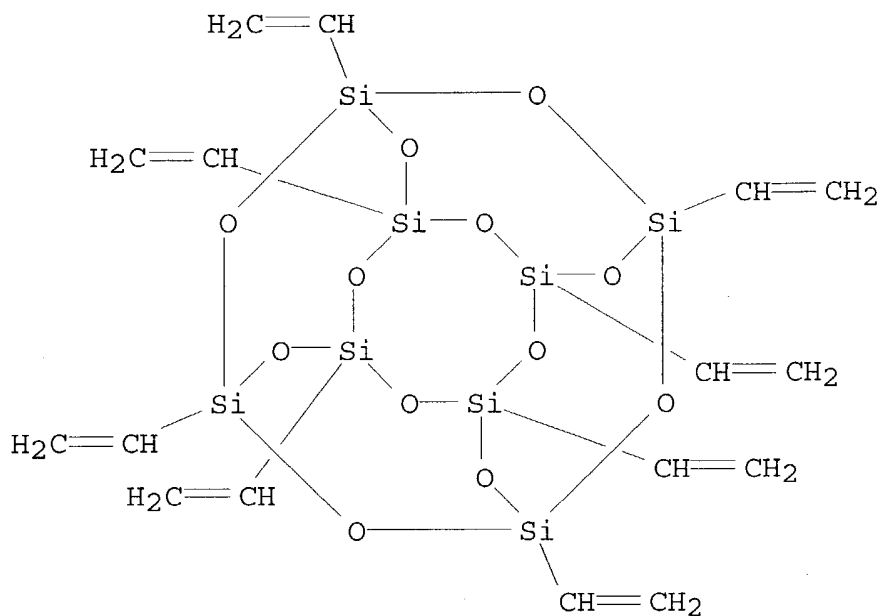


IT 69655-76-1, Octavinylsilsesquioxane

(dry methods for fabricating polymer films with three-dimensional structure for integrated optics)

RN 69655-76-1 HCA

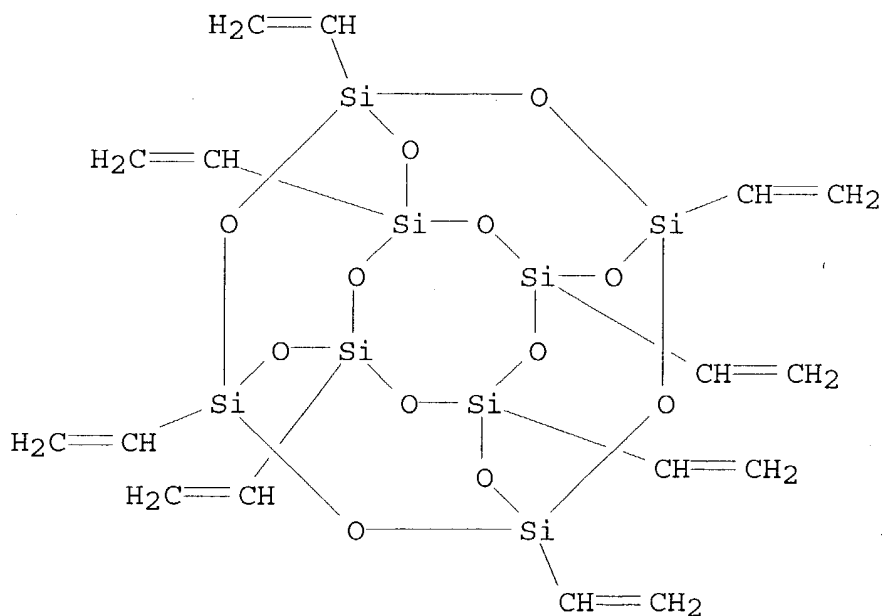
CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octaethenyl- (9CI)
(CA INDEX NAME)



- IC ICM G02B006-138
ICS G03F007-027; G03F007-36
- CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 74
- IT Lenses
Optical integrated circuits
Photolithography
(dry methods for fabricating polymer films with three-dimensional structure for integrated optics)
- IT **Photoresists**
(dry; dry methods for fabricating polymer films with three-dimensional structure for integrated optics)
- IT **188356-58-3**
(dry methods for fabricating polymer films with three-dimensional structure for integrated optics)
- IT **69655-76-1, Octavinylsilsesquioxane**
(dry methods for fabricating polymer films with three-dimensional structure for integrated optics)
- L61 ANSWER 6 OF 9 HCA COPYRIGHT 2003 ACS on STN
126:124674 Three-dimensional electron-beam **lithography** using an all-dry **resist** process. Babin, S.; Koops, H. W. P. (Deutsche Telekom AG, Technologiezentrum, Darmstadt, D-64295, Germany). Journal of Vacuum Science & Technology, B: Microelectronics and Nanometer Structures, 14(6), 3860-3863 (English) 1996. CODEN: JVTBD9. ISSN: 0734-211X. Publisher: American Institute of Physics.
- AB Micromechanics, microelectronics, and micro-optics favor

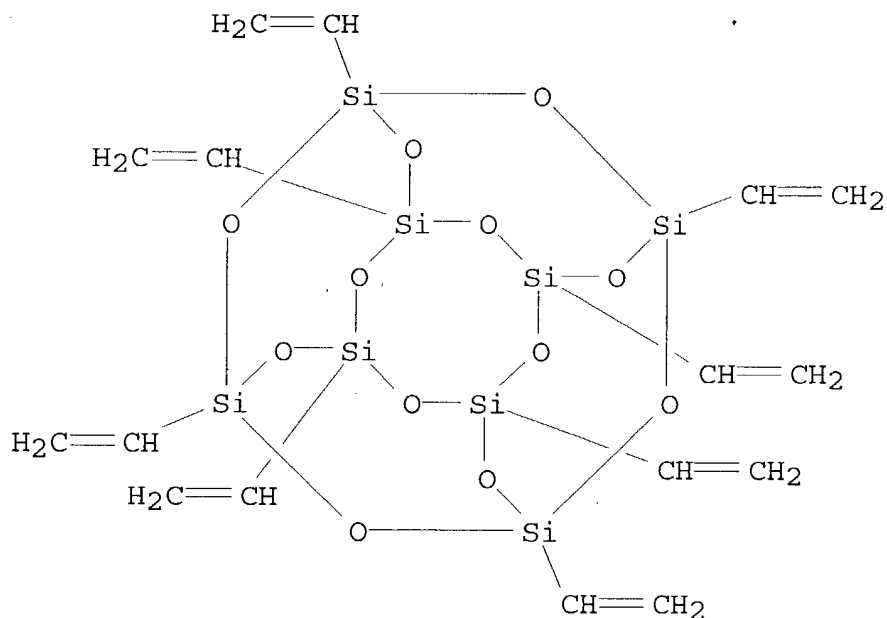
structurization of three-dimensional surfaces. Dry **resist** processes present fewer hazards to personnel and environment than conventional wet **resist** processes. The neg. tone dry **resist** octavinylsilsesquioxane is investigated in its applicability to three-dimensional structurization of surfaces having a high relief. This **resist**, also known as V-T8, enables coating of arbitrary substrates by evapn. in high vacuum. After exposure it is developed in high vacuum by a dry thermal treatment at 200.degree.C. The **resist** is characterized with electron exposures with an energy ranging from 5 to 50 keV. Its sensitivity is 40 .mu.C/cm2 at 20 keV. The **resist** exhibits high dry etch resistivity. Its contrast is increased from 0.7 to 2.1 using plasma etching in CF4 as a post-development step. The dry **resist** is employed to structure 250 .mu.m deep steep surface steps and to modify fabricated three-dimensional structures with dot gratings for metrol. applications.

IT 69655-76-1, Octavinylsilsesquioxane
 (three-dimensional electron-beam **lithog.** using neg.
 tone dry **resist** octavinylsilsesquioxane)
 RN 69655-76-1 HCA
 CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octaethenyl- (9CI)
 (CA INDEX NAME)



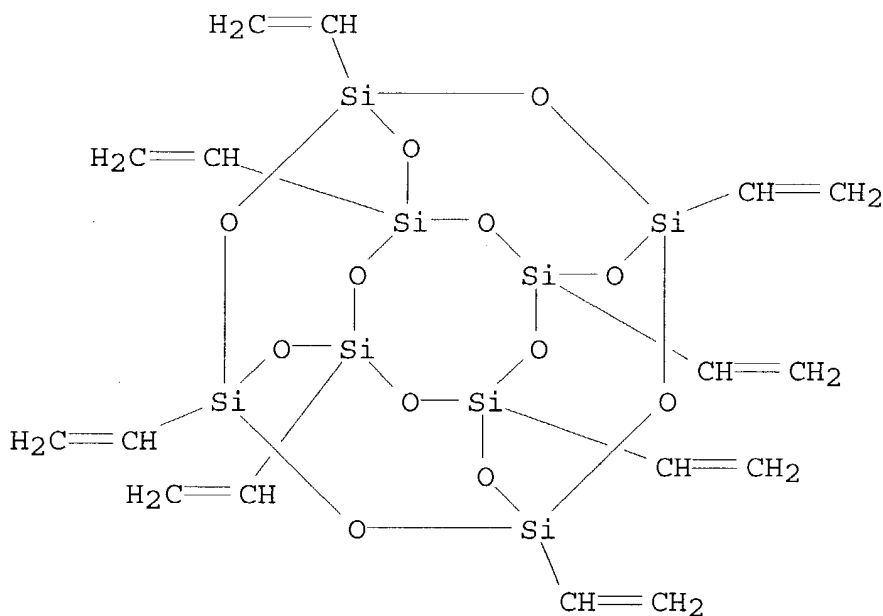
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and
 Other Reprographic Processes)
 ST electron beam **lithog** dry **resist**
 octavinylsilsesquioxane; contrast enhancement **resist**
 octavinylsilsesquioxane plasma etching
 IT Sputtering
 (etching; contrast enhancement of electron-beam dry

- resist** octavinylsilsesquioxane by plasma etching in CF4)
- IT Etching
(sputter; contrast enhancement of electron-beam dry
resist octavinylsilsesquioxane by plasma etching in CF4)
- IT Electron beam **lithography**
Electron beam **resists**
(three-dimensional electron-beam **lithog.** using neg.
tone dry **resist** octavinylsilsesquioxane)
- IT 75-73-0
(contrast enhancement of electron-beam dry **resist**
octavinylsilsesquioxane by plasma etching in CF4)
- IT **69655-76-1**, Octavinylsilsesquioxane
(three-dimensional electron-beam **lithog.** using neg.
tone dry **resist** octavinylsilsesquioxane)
- L61 ANSWER 7 OF 9 HCA COPYRIGHT 2003 ACS on STN
- 126:67345 Dry **resist** technology to fabricate optimized
microlenses centered to the end of a monomode fiber with electron
beam **lithography**. Babin, Sergey; Weber, Markus; Koops,
Hans. W.P. (Deutsche Telekom AG, Technologiezentrum, Darmstadt,
D-64295, Germany). Proceedings of SPIE-The International Society
for Optical Engineering, 2863 (Current Developments in Optical Design
and Engineering VI), 95-101 (English) 1996. CODEN: PSISDG. ISSN:
0277-786X. Publisher: SPIE-The International Society for Optical
Engineering.
- AB The fabrication of microlenses on flat and three-dimensional
substrates is described. A totally dry **resist** process is
used. The characteristics of this novel process are investigated.
A technique for lens positioning and exposure was developed for a
scanning electron microscope using an image processor as a beam
control system. The hyperbolic profile of the microlenses is
computer generated. Microlenses of cylindrical, round, and
elliptical geometry were fabricated on a Si wafer and on the end of
a monomode quartz fiber. Focusing of IR light by fabricated
microlenses is demonstrated.
- IT **69655-76-1**, Octavinylsilsesquioxane
(electron beam **lithog.** dry **resist** process for
fabrication of refractive microlenses centered to end of monomode
fiber)
- RN 69655-76-1 HCA
- CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octaethenyl- (9CI)
(CA INDEX NAME)



- CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 73
- ST electron **lithog** dry **resist** process microlens
- IT Microlenses
(IR; electron beam **lithog.** dry **resist** process for fabrication of refractive microlenses centered to end of monomode fiber)
- IT Electron beam **lithography**
Electron beam **resists**
Fiber optics
(electron beam **lithog.** dry **resist** process for fabrication of refractive microlenses centered to end of monomode fiber)
- IT Silsesquioxanes
(electron beam **lithog.** dry **resist** process for fabrication of refractive microlenses centered to end of monomode fiber)
- IT IR radiation
(focusing of; microlenses centered to end of monomode fiber for IR focusing fabricated by electron beam **lithog.** dry **resist** process)
- IT Scanning electron microscopes
(in electron beam **lithog.** dry **resist** process for fabrication of refractive microlenses centered to end of monomode fiber)
- IT 69655-76-1, Octavinylsilsesquioxane
(electron beam **lithog.** dry **resist** process for fabrication of refractive microlenses centered to end of monomode fiber)

- fiber)
- IT 7440-21-3, Silicon, uses
(electron beam **lithog.** dry **resist** process for
fabrication of refractive microlenses centered to end of monomode
fiber on silicon substrate)
- L61 ANSWER 8 OF 9 HCA COPYRIGHT 2003 ACS on STN
121:191034 Investigation of new dry high sensitive **resist**
using 100 kV electron **lithography**. Babin, S. V.;
Holopkin, A. I.; Lyakhov, M. N.; Valiev, K. A.; Velikov, L. V.;
Zhikharev, E. N. (Phys. and Technol. Inst., Moscow, 117218, Russia).
Microelectronic Engineering, 23(1-4), 303-5 (English) 1994. CODEN:
MIENEF. ISSN: 0167-9317.
- AB 100 KV electron beam **lithog.** (EBL) system was used for
octavinylsilsesquioxane film characterization as an electron
resist for nanometer scale microstructuring. The
resist processing was totally dry: deposition by evapn. in
vacuum and thermal development after exposure. High **resist**
sensitivity and nanometer scale resolu. were obtained.
- IT 69655-76-1, Octavinylsilsesquioxane
(electron **lithog.** of dry high sensitive
photoresists from)
- RN 69655-76-1 HCA
- CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octaethenyl- (9CI)
(CA INDEX NAME)



- CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and
Other Reprographic Processes)
- ST octavinylsilsesquioxane **resist** electron **lithog**
dry process

- IT Silsesquioxanes
(dry high sensitive **photoresists** from)
- IT **Resists**
(octavinylsilsesquioxane, totally dry deposition and development of)
- IT **Lithography**
(electron-beam, of dry high sensitive **resists** from octavinylsilsesquioxane)
- IT **69655-76-1**, Octavinylsilsesquioxane
(electron **lithog.** of dry high sensitive **photoresists** from)

L61 ANSWER 9 OF 9 HCA COPYRIGHT 2003 ACS on STN

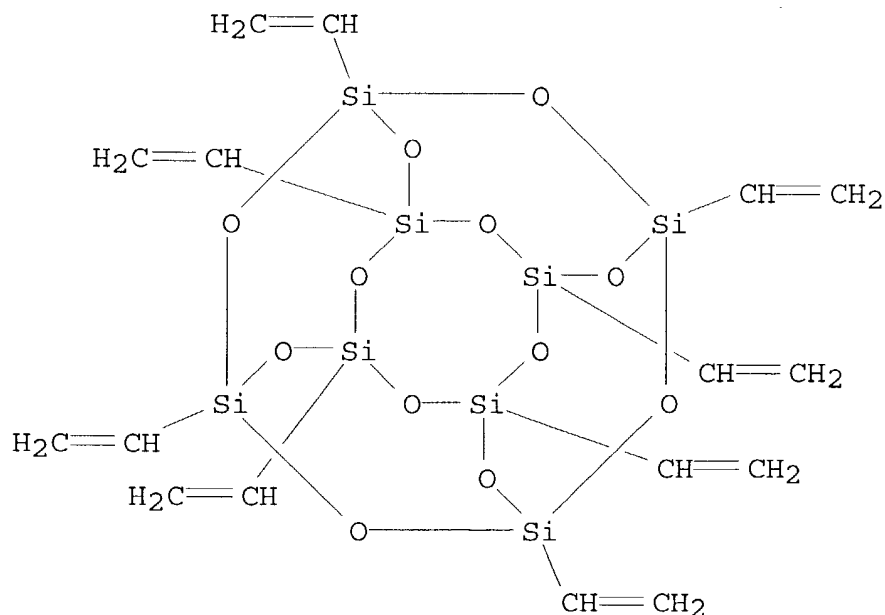
98:207453 All-dry vacuum submicron **lithography**. Korchkov, V. P.; Martynova, T. N.; Danilovich, V. S. (Inst. Inorg. Chem., Novosibirsk, 630090, USSR). Thin Solid Films, 101(4), 369-72 (English) 1983. CODEN: THSFAP. ISSN: 0040-6090.

AB An evaluation was made of the known attempts at the realization of a dry **lithog.** process. The shortcomings and the causes of failure of all-dry **lithog.** processes were pointed out. The results of a study of an all-dry **lithog.** process based on octavinylsilsesquioxane were given. The availability, the simplicity, and the compatibility of this process with std. technols. were shown.

IT **69655-76-1**
(**resist** from, for dry-process vacuum submicron **lithog.**)

RN 69655-76-1 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octaethenyl- (9CI)
(CA INDEX NAME)



CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and
Other Reprographic Processes)
ST vacuum submicron dry **lithog**; vinylsilsequioxane
resist dry vacuum **lithog**; silsesquioxane octavinyl
resist dry **lithog**
IT **Lithography**
(dry, vacuum, submicron, with octavinylsilsesquioxane)
IT **Resists**
(electron-beam, octavinylsilsesquioxane as, for dry vacuum
lithog.)
IT **69655-76-1**
(**resist** from, for dry-process vacuum submicron
lithog.)

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L44 ANSWER 1 OF 25 HCA COPYRIGHT 2003 ACS on STN

139:188229 High sensitivity nanocomposite resists for EUV lithography.
Azam Ali, M.; Gonsalves, K. E.; Golovkina, V.; Cerrina, F.
(Department of Chemistry and Cameron Applied Research Center,
Polymer Chemistry NanoTechnology Lab., The University of North
Carolina, Charlotte, NC, 28223, USA). Microelectronic Engineering,
65(4), 454-462 (English) 2003. CODEN: MIENEF. ISSN: 0167-9317.
Publisher: Elsevier Science B.V..

AB A novel nanocomposite photoresist was synthesized for extreme UV
lithog. (EUVL) by a radical polymn. process. This resist system
exhibited enhanced sensitivity and contrast for EUVL. The potential
for EUVL nanofeatures is also examd. The high sensitivity and the
desirable contrast in this resist, indicates that it is a promising
candidate not only for sub-100 nm resolu. EUVL, but also for X-ray
lithog. and low voltage electron beam lithog.

IT **461699-74-1**

(high sensitivity nanocomposite resists for EUV lithog.)

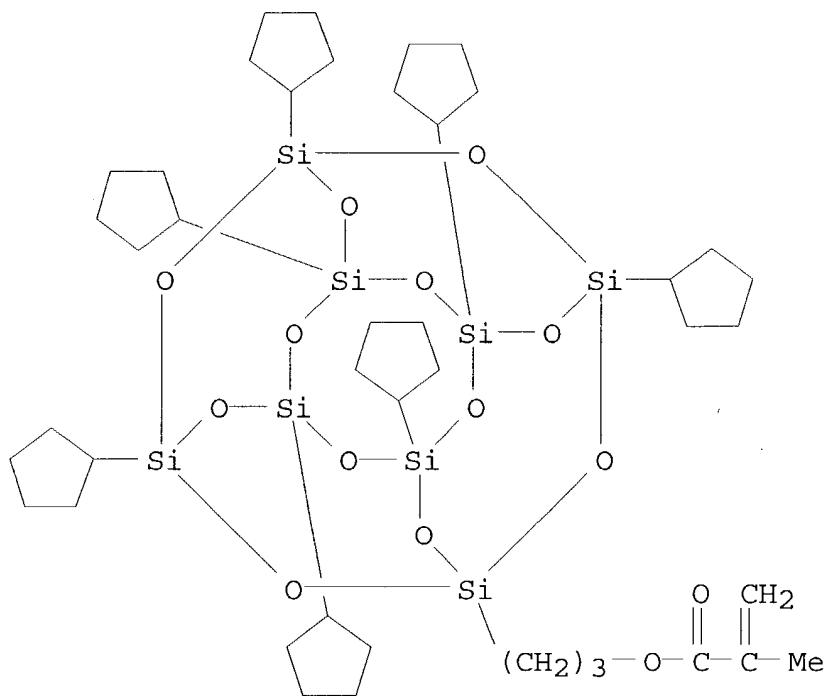
RN 461699-74-1 HCA

CN Sulfonium, dimethyl[4-[(2-methyl-1-oxo-2-propenyl)oxy]phenyl]-, salt
with trifluoromethanesulfonic acid (1:1), polymer with
1,1-dimethylethyl 2-methyl-2-propenoate, 3-
(heptacyclopentylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)pro
pyl 2-methyl-2-propenoate, methyl 2-methyl-2-propenoate and
2-methyl-2-propenoic acid (9CI) (CA INDEX NAME)

CM 1

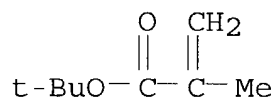
CRN 169391-91-7

CMF C42 H74 O14 Si8



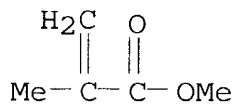
CM 2

CRN 585-07-9
CMF C8 H14 O2



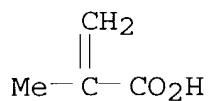
CM 3

CRN 80-62-6
CMF C5 H8 O2



CM 4

CRN 79-41-4
CMF C4 H6 O2



CM 5

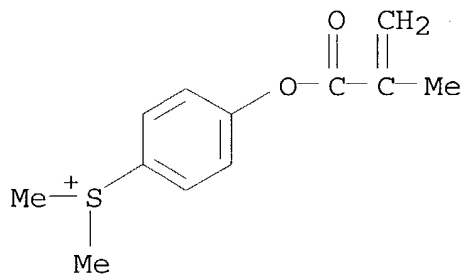
CRN 352455-54-0

CMF C12 H15 O2 S . C F3 O3 S

CM 6

CRN 141718-72-1

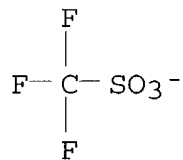
CMF C12 H15 O2 S



CM 7

CRN 37181-39-8

CMF C F3 O3 S



IT 461699-74-1

(high sensitivity nanocomposite resists for EUV lithog.)

L44 ANSWER 2 OF 25 HCA COPYRIGHT 2003 ACS on STN

139:180690 Organic-inorganic hybrid gels having functionalized silsesquioxanes. Kim, Kyung-Min; Chujo, Yoshiki (Department of Polymer Chemistry, Graduate School of Engineering, Kyoto University, Kyoto, 606-8501, Japan). Journal of Materials Chemistry, 13(6), 1384-1391 (English) 2003. CODEN: JMACEP. ISSN: 0959-9428. Publisher: Royal Society of Chemistry.

AB Hybrid terpolymers consisting of polyhedral oligomeric

silsesquioxanes (POSS), N,N-dimethylacrylamide, and bipyridine monomer were synthesized by a common radical polymn. method and their structures and thermal properties were studied by FT-IR, ¹H NMR, DSC, TGA. The thermal stabilities of the hybrid terpolymers increased on increasing the content of POSS in the feed ratio. New hybrid gels contg. POSS were prepd. through the coordination of various metal ions to 2,2'-bipyridine-modified hybrid terpolymers. Highly concd. solns. of terpolymers with iron(ii) sulfate or ruthenium(iii) chloride gave hybrid gels in good yields. No hybrid gel was formed with nickel(ii) chloride even at much higher concns. of nickel ions due to rapid ligand exchange reactions causing the polymer network to disappear as a result of a change in the nature of the coordination bonds from an intermol. network to an intramol. network. The degree of swelling and the thermal stability of the gels in various solvents were dependent on the content of POSS moiety in the hybrid gel and the ruthenium gel was considerably more stable than the iron and nickel gels. The hybrid gels contg. POSS had properties characteristic of hydrogels and those of lipogel depending on the content of POSS in the hybrid gel. By anal. of the degree of swelling, the amt. of POSS moiety in the hybrid gel has a significant effect on the degree of swelling in this system.

IT 579470-10-3P

(prepn. of hybrid terpolymer contg. functionalized silsesquioxanes for org.-inorg. hybrid gels)

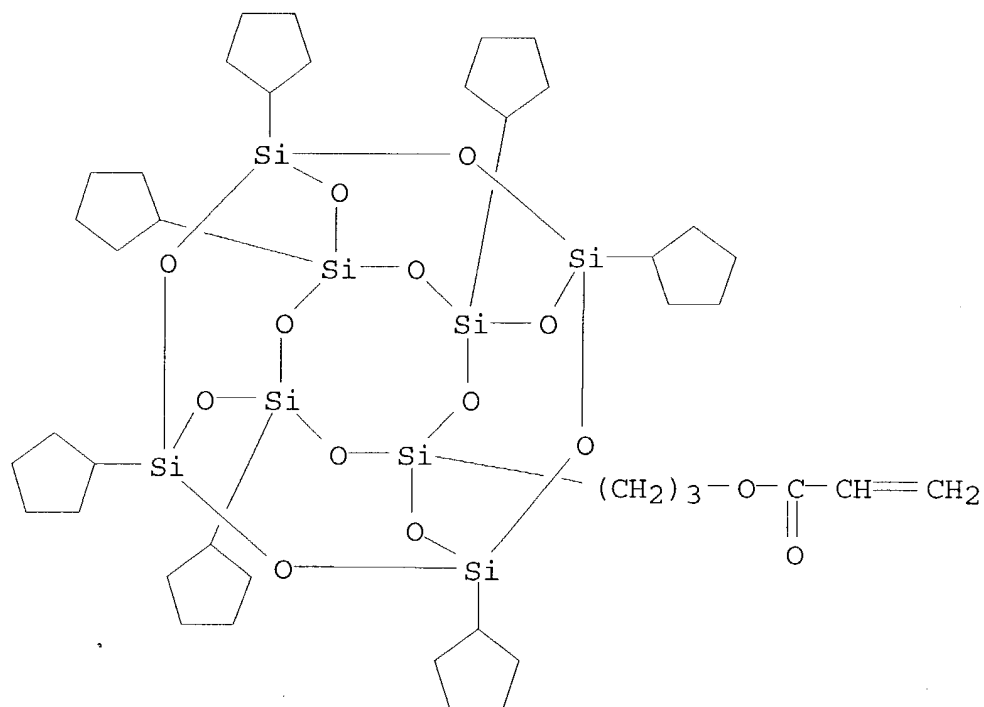
RN 579470-10-3 HCA

CN 2-Propenoic acid, 3-(heptacyclopentylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)propyl ester, polymer with N,N-dimethyl-2-propenamide and 4-ethenyl-4'-methyl-2,2'-bipyridine (9CI) (CA INDEX NAME)

CM 1

CRN 387820-81-7

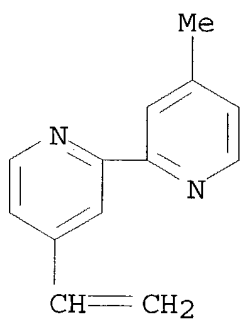
CMF C41 H72 O14 Si8



CM 2

CRN 74173-48-1

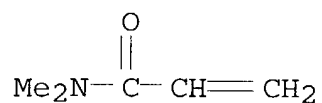
CMF C13 H12 N2



CM 3

CRN 2680-03-7

CMF C5 H9 N O

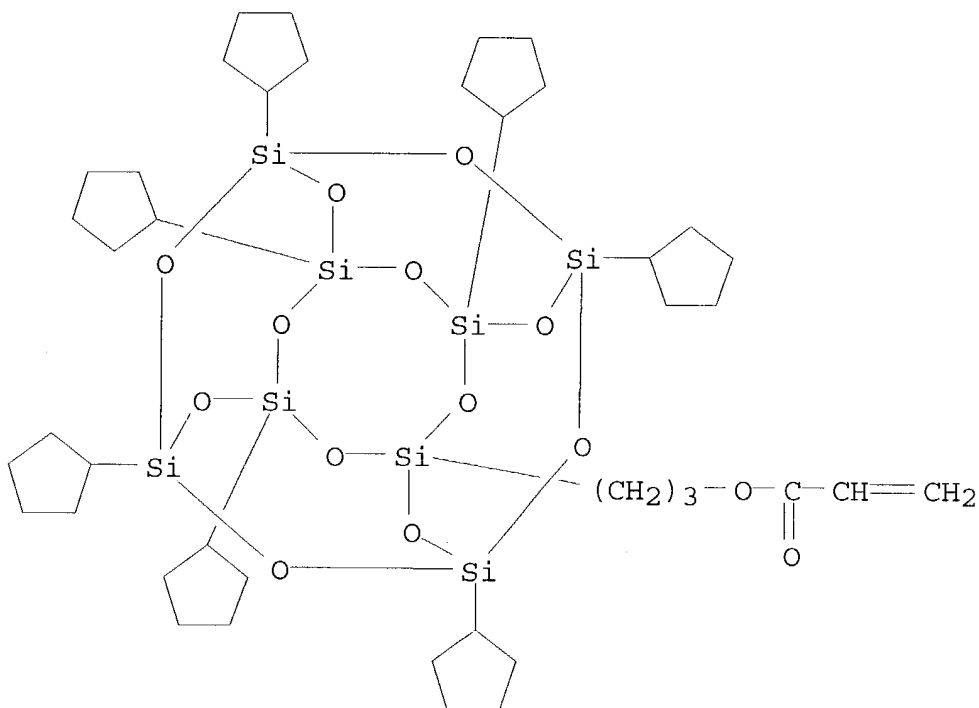


IT **579470-10-3DP**, complex with metal ions
 (prepn. of org.-inorg. hybrid gels from terpolymer contg.
 functionalized silsesquioxanes in the presence of metal ions)
 RN 579470-10-3 HCA
 CN 2-Propenoic acid, 3-(heptacyclopentylpentacyclo[9.5.1.13,9.15,15.17,
 13]octasiloxanyl)propyl ester, polymer with N,N-dimethyl-2-
 propenamide and 4-ethenyl-4'-methyl-2,2'-bipyridine (9CI) (CA INDEX
 NAME)

CM 1

CRN 387820-81-7

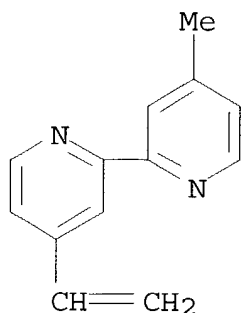
CMF C41 H72 O14 Si8



CM 2

CRN 74173-48-1

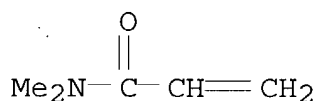
CMF C13 H12 N2



CM 3

CRN 2680-03-7

CMF C5 H9 N O



IT 579470-10-3P

(prepn. of hybrid terpolymer contg. functionalized
silsesquioxanes for org.-inorg. hybrid gels)

IT 579470-10-3DP, complex with metal ions

(prepn. of org.-inorg. hybrid gels from terpolymer contg.
functionalized silsesquioxanes in the presence of metal ions)

L44 ANSWER 3 OF 25 HCA COPYRIGHT 2003 ACS on STN

139:69571 ABA triblock copolymers containing polyhedral oligomeric silsesquioxane pendant groups: synthesis and unique properties. Pyun, Jeffrey; Matyjaszewski, Krzysztof; Wu, Jian; Kim, Gyeong-Man; Chun, Seung B.; Mather, Patrick T. (Center for Macromolecular Engineering, Department of Chemistry, Carnegie Mellon University, Pittsburgh, PA, 15213, USA). *Polymer*, 44(9), 2739-2750 (English) 2003. CODEN: POLMAG. ISSN: 0032-3861. Publisher: Elsevier Science Ltd..

AB The synthesis and characterization of POSS (polyhedral oligomeric silsesquioxane) contg. ABA triblock copolymers is reported. The use of atom transfer radical polymn. (ATRP) enabled the prepn. of well-defined model copolymers possessing a rubbery poly(Bu acrylate) (pBA) middle segment and glassy poly(3-(3,5,7,9,11,13,15-hepta-isobutyl-pentacyclo[9.5.1.13,9.15,15.17,13]-octasiloxane-1-yl)propyl methacrylate) (p(MA-POSS)) outer segments. By tuning the relative compn. and d.p. (DP) of the two segments, phase sepd. microstructures were formed in thin films of the copolymer. Specifically, dynamic mech. anal. and transmission electron microscopy (TEM) observations reveal that for a small molar ratio of p(MA-POSS)/pBA (DP = 6/481/6) no evidence of microphase sepn. is

evident while a large ratio (10/201/10) reveals strong microphase sepn. Surprisingly, the microphase-sepd. material exhibits a tensile modulus larger than expected (ca. 2 .times. 108 Pa) for a continuous rubber phase for temps. between a pBA-related Tg and a softening point for the p(MA-POSS)-rich phase. Transmission electron microscopy (TEM) images with selective staining for POSS revealed the formation of a morphol. consisting of pBA cylinders in a continuous p(MA-POSS) phase. Thermal studies have revealed the existence of two clear glass transitions in the microphase-sepd. system with strong phys. aging evident for annealing temps. near the Tg of the higher Tg phase (p(MA-POSS)). The obsd. aging is reflected in wide-angle X-ray scattering as the strengthening of a low-angle POSS-dominated scattering peak, suggesting some level of ordering during phys. aging. The Tg of the POSS-rich phase obsd. in the microphase sepd. triblock copolymer was nearly 25.degree. higher than that of a POSS-homopolymer of the same mol. wt., suggesting a strong confinement-based enhancement of Tg in this system.

IT 425409-08-1P

(synthesis and unique properties of ABA triblock copolymers
contg. polyhedral oligomeric silsesquioxane pendant groups)

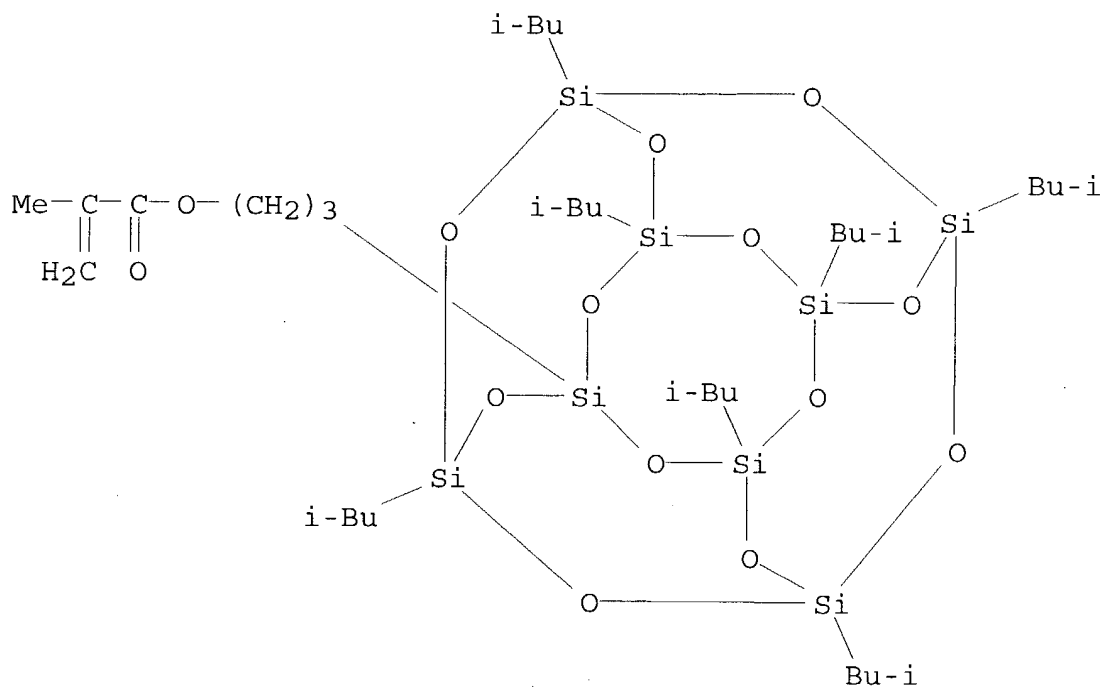
RN 425409-08-1 HCA

CN 2-Propenoic acid, 2-methyl-, 3-[heptakis(2-methylpropyl)pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl]propyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 307531-94-8

CMF C35 H74 O14 Si8



IT 255872-36-7P 548798-38-5P

(triblock; synthesis and unique properties of ABA triblock copolymers contg. polyhedral oligomeric silsesquioxane pendant groups)

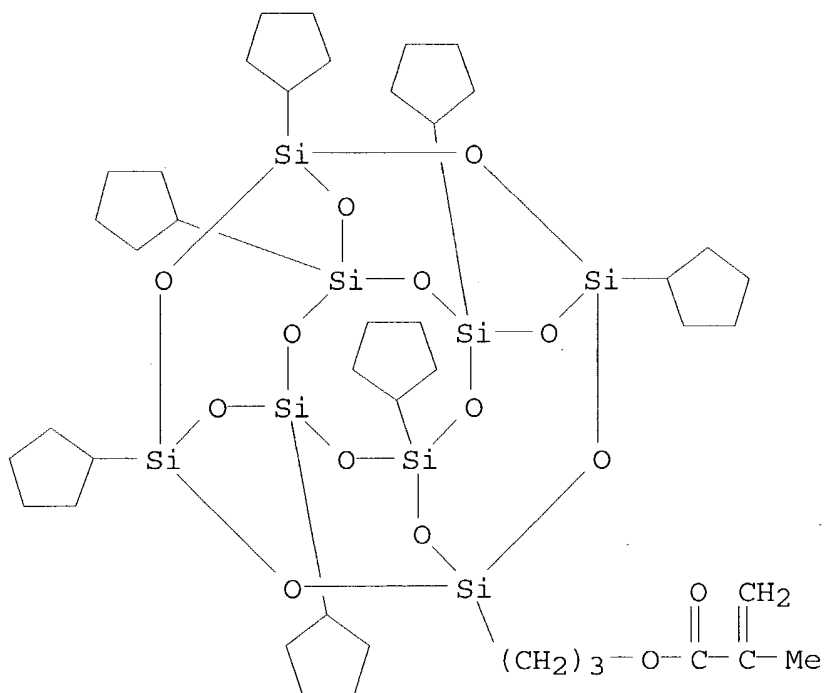
RN 255872-36-7 HCA

CN 2-Propenoic acid, 2-methyl-, 3-(heptacyclopentylpentacyclo[9.5.1.13, 9.15,15.17,13]octasiloxanyl)propyl ester, polymer with butyl 2-propenoate, block (9CI) (CA INDEX NAME)

CM 1

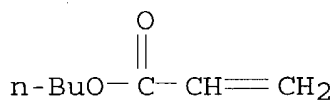
CRN 169391-91-7

CMF C42 H74 O14 Si8



CM 2

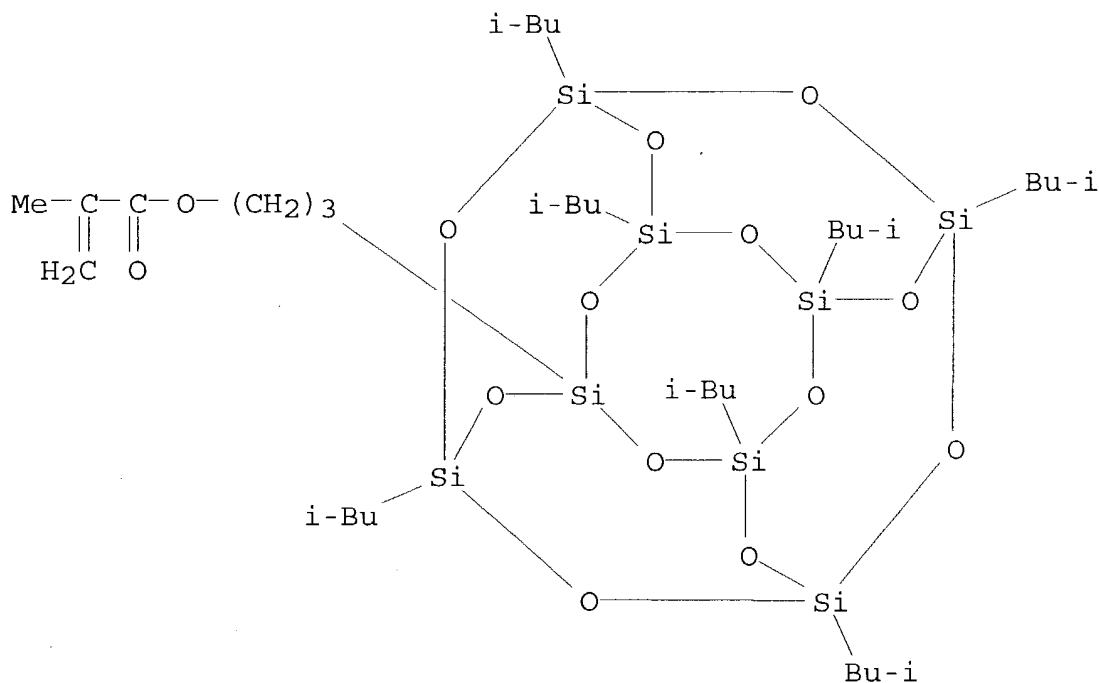
CRN 141-32-2
CMF C7 H12 O2



RN 548798-38-5 HCA
CN 2-Propenoic acid, 2-methyl-, 3-[heptakis(2-methylpropyl)pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl]propyl ester, polymer with butyl 2-propenoate, block (9CI) (CA INDEX NAME)

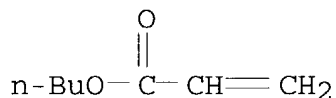
CM 1

CRN 307531-94-8
CMF C35 H74 O14 Si8



CM 2

CRN 141-32-2
CMF C7 H12 O2



IT 425409-08-1P

(synthesis and unique properties of ABA triblock copolymers
contg. polyhedral oligomeric silsesquioxane pendant groups)

IT 255872-36-7P 548798-38-5P

(triblock; synthesis and unique properties of ABA triblock
copolymers contg. polyhedral oligomeric silsesquioxane pendant
groups)

L44 ANSWER 4 OF 25 HCA COPYRIGHT 2003 ACS on STN

138:311424 Evaluation of siloxane and polyhedral silsesquioxane
copolymers for 157 nm lithography. Bellas, V.; Tegou, E.; Raptis,
I.; Gogolides, E.; Argitis, P.; Iatrou, H.; Hadjichristidis, N.;
Sarantopoulou, E.; Cefalas, A. C. (Institute of Microelectronics,
NCSR Demokritos, Aghia Paraskevi, 15310, Greece). Journal of Vacuum
Science & Technology, B: Microelectronics and Nanometer Structures,
20(6), 2902-2908 (English) 2002. CODEN: JVTBD9. ISSN: 0734-211X.

Publisher: American Institute of Physics.

AB Siloxane and silsesquioxane copolymers have been synthesized and first evaluated as potential components of 157 nm resist materials. In block copolymers of dimethylsiloxane and tert-Bu methacrylate neg. imaging chem. dominates at 157 nm, due to the presence of the siloxane component, although pos. imaging in aq. base developers via chem. amplification was obtained at longer wavelengths (248 nm). The same behavior is obsd. in graft copolymers of dimethylsiloxane and tert-Bu methacrylate. On the other hand, random copolymers of polymerizable polyhedral oligomeric silsesquioxane monomers with various acrylates, including partially fluorinated, can be used as components of resist formulations that provide pos. imaging at 157 nm, aq. base development, and physicochem. properties which resemble those of conventional poly(meth)acrylates. Pattern transfer properties depend on the selection of the silsesquioxane component. Polymers contg. 30% or higher wt./wt. ethyl-substituted silsesquioxane cages provide the necessary etch resistance as well as low surface roughness to oxygen plasma at 100 nm film thickness, allowing bilayer 157 nm lithog., even without further absorbance optimization.

IT 302347-60-0P 509106-75-6P 509106-76-7P
509106-77-8P 509106-78-9P

(evaluation of siloxane and polyhedral silsesquioxane copolymers for 157 nm lithog.)

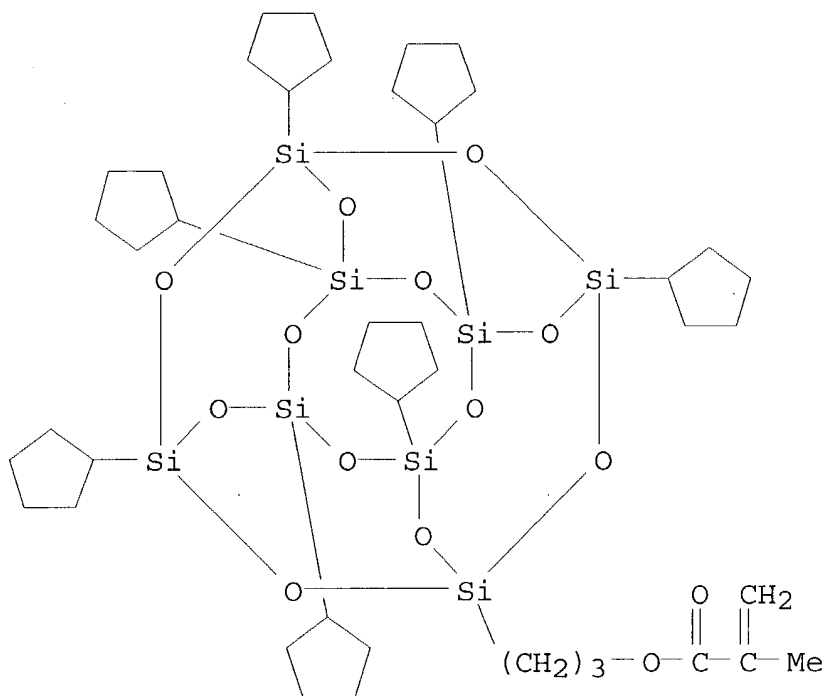
RN 302347-60-0 HCA

CN 2-Propenoic acid, 2-methyl-, 1,1-dimethylethyl ester, polymer with 3-(heptacyclopentylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)p
ropyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

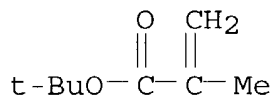
CRN 169391-91-7

CMF C42 H74 O14 Si8



CM 2

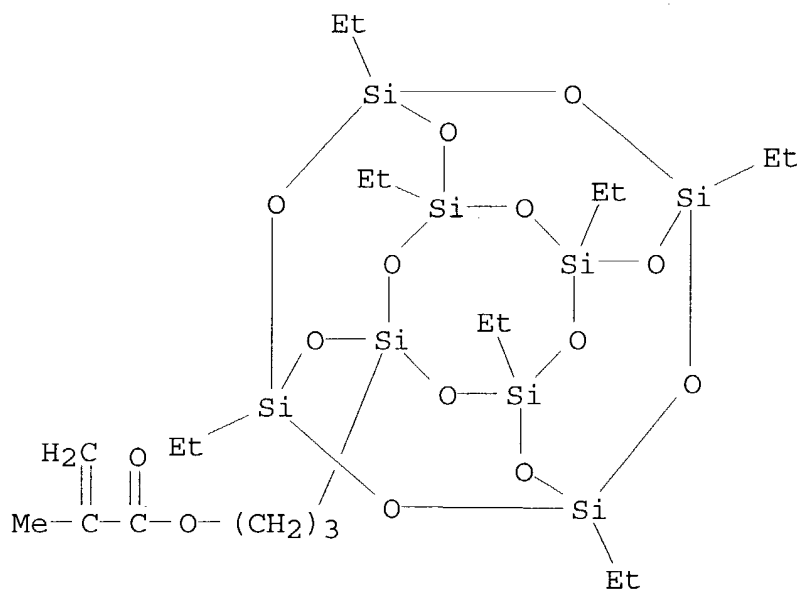
CRN 585-07-9
CMF C8 H14 O2



RN 509106-75-6 HCA
CN 2-Propenoic acid, 2-methyl-, 1,1-dimethylethyl ester, polymer with
3-(heptaethylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)propyl
2-methyl-2-propenoate (9CI) (CA INDEX NAME)

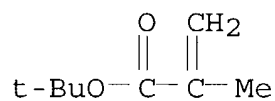
CM 1

CRN 509106-74-5
CMF C21 H46 O14 Si8



CM 2

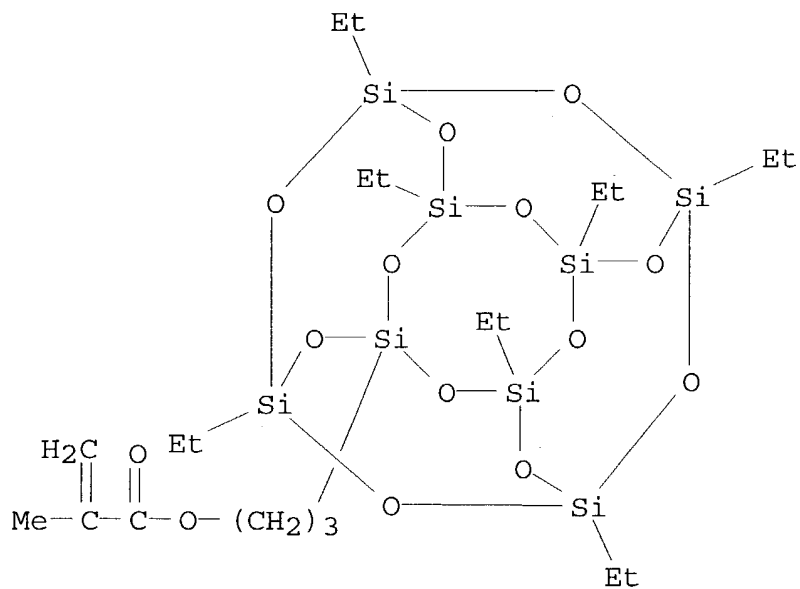
CRN 585-07-9
CMF C8 H14 O2



RN 509106-76-7 HCA
CN 2-Propenoic acid, 2-methyl-, 3-(heptaethylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)propyl ester, polymer with dihydro-3-methylene-2,5-furandione and methyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

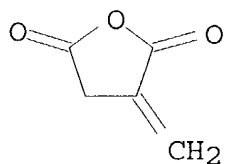
CRN 509106-74-5
CMF C21 H46 O14 Si8



CM 2

CRN 2170-03-8

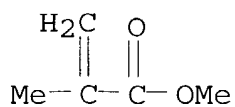
CMF C5 H4 O3



CM 3

CRN 80-62-6

CMF C5 H8 O2

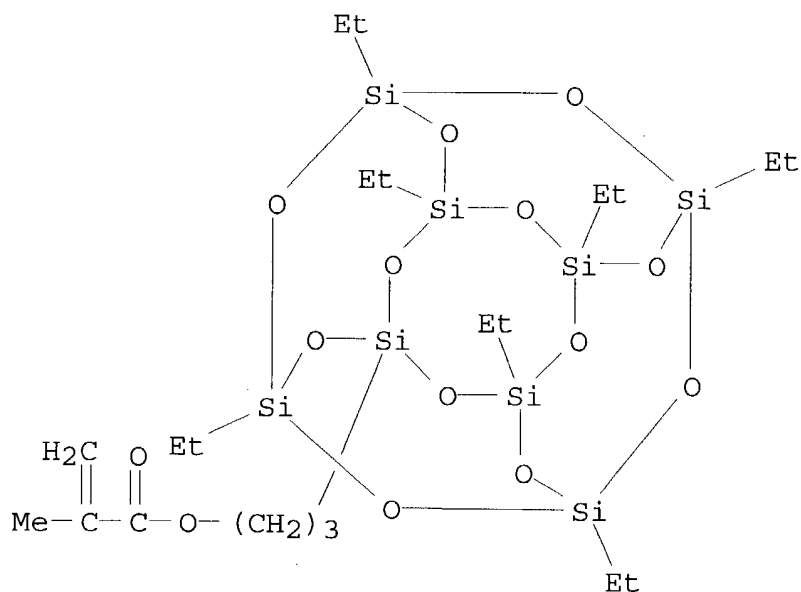


RN 509106-77-8 HCA

CN 2-Propenoic acid, 2-methyl-, 1,1-dimethylethyl ester, polymer with
 3-(heptaethylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)propyl
 2-methyl-2-propenoate and methyl 2-methyl-2-propenoate (9CI) (CA
 INDEX NAME)

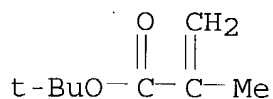
CM 1

CRN 509106-74-5
 CMF C21 H46 O14 Si8



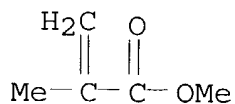
CM 2

CRN 585-07-9
 CMF C8 H14 O2



CM 3

CRN 80-62-6
 CMF C5 H8 O2

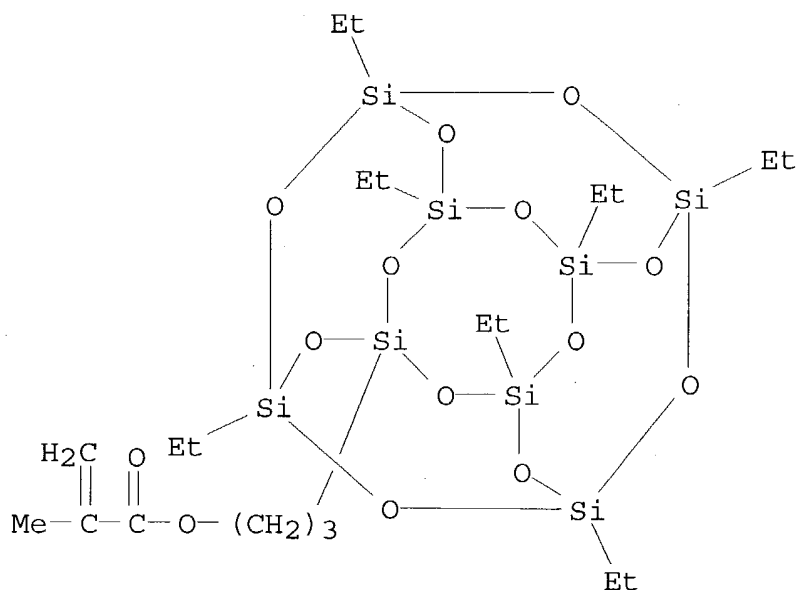


RN 509106-78-9 HCA
 CN 2-Propenoic acid, 2-methyl-, 3-(heptaethylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)propyl ester, polymer with
 2-(trifluoromethyl)-2-propenoic acid (9CI) (CA INDEX NAME)

CM 1

CRN 509106-74-5

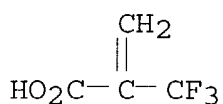
CMF C21 H46 O14 Si8



CM 2

CRN 381-98-6

CMF C4 H3 F3 O2



IT 302347-60-0P 509106-75-6P 509106-76-7P
509106-77-8P 509106-78-9P

(evaluation of siloxane and polyhedral silsesquioxane copolymers
for 157 nm lithog.)

L44 ANSWER 5 OF 25 HCA COPYRIGHT 2003 ACS on STN

138:107082 Synthesis and properties of novel fluoroalkyl end-capped oligomers containing silsesquioxane segments. Sawada, Hideo; Yoshioka, Hiroaki; Ohashi, Ryusei; Kawase, Tokuzo (Department of Chemistry, Nara National College of Technology, Nara, 639-1080, Japan). Journal of Applied Polymer Science, 86(14), 3486-3493 (English) 2002. CODEN: JAPNAB. ISSN: 0021-8995. Publisher: John Wiley & Sons, Inc..

AB Fluoroalkyl end-capped homo- and cooligomers contg. silsesquioxane

segments were prep'd. by the reactions of fluoroalkanoyl peroxides with the corresponding methacrylate monomer-bearing silsesquioxane unit (Si-MMA) and comonomers such as N,N-dimethylacrylamide (DMAA) and acrylic acid (ACA). These new fluorinated Si-MMA oligomers were easily sol. in various org. solvents and were able to reduce the surface tension of m-xylene effectively. The modified poly(Me methacrylate) [PMMA] and glass surface treated with fluorinated Si-MMA homo-oligomers exhibited a strong oleophobicity, although these fluorinated oligomers possess high oleophilic silsesquioxane segments. In contrast, the modified PMMA surface treated with fluorinated Si-MMA-DMAA cooligomers exhibited a good hydrophilicity with a strong oleophobicity. In a series of fluorinated Si-MMA oligomers, fluorinated Si-MMA homo-oligomers had a relatively high thermal stability. Therefore, these fluoroalkyl end-capped Si-MMA oligomers are suggested to have high potential for new functional materials through their unique properties such as a high soly. and surface active properties.

IT 169699-57-4P 488760-37-8P 488760-38-9P

(synthesis and properties of novel fluoroalkyl end-capped oligomers contg. silsesquioxane segments)

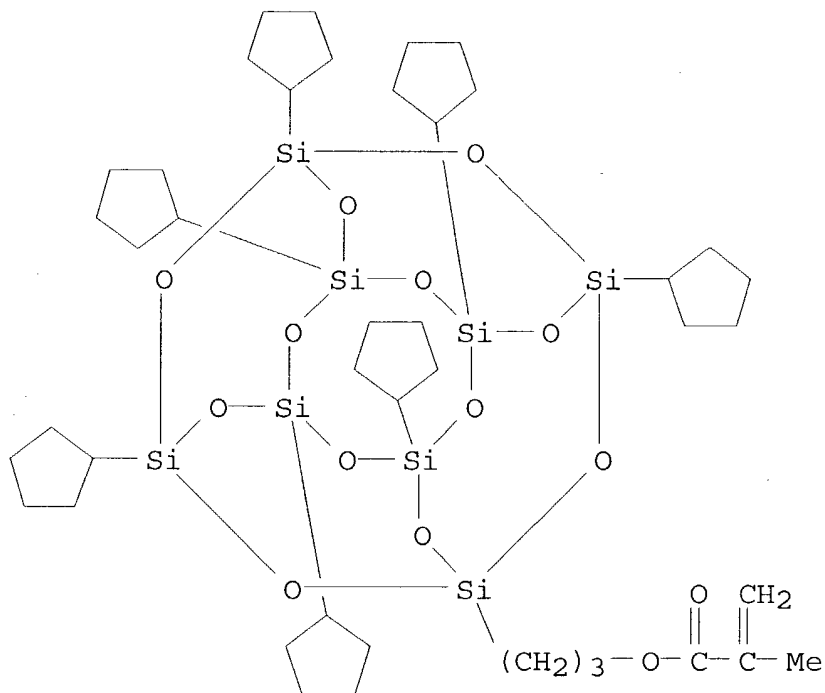
RN 169699-57-4 HCA

CN 2-Propenoic acid, 2-methyl-, 3-(heptacyclopentylpentacyclo[9.5.1.13, 9.15,15.17,13]octasiloxanyl)propyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 169391-91-7

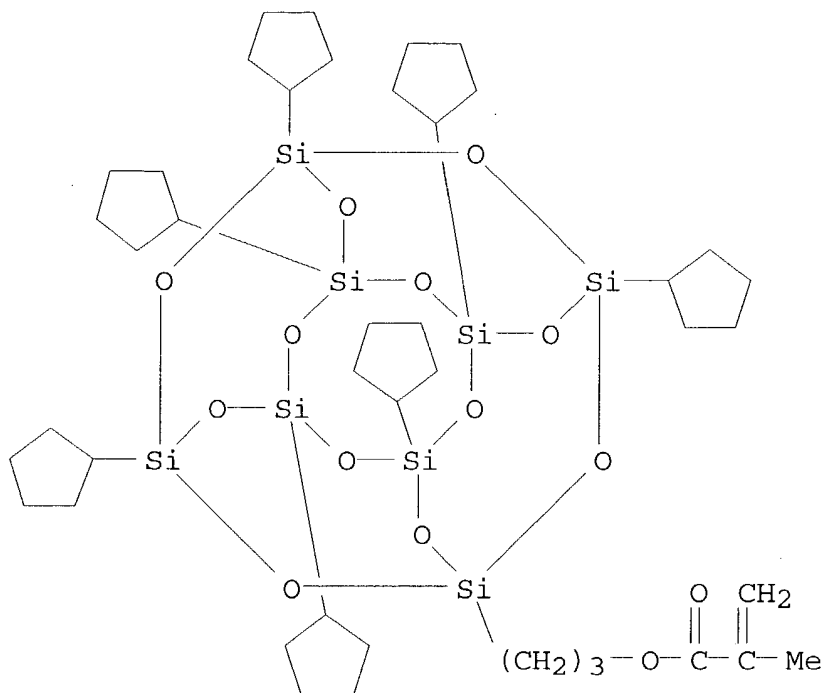
CMF C42 H74 O14 Si8



RN 488760-37-8 HCA
 CN 2-Propenoic acid, 2-methyl-, 3-(heptacyclopentylpentacyclo[9.5.1.13, 9.15,15.17,13]octasiloxanyl)propyl ester, polymer with 2-propenoic acid (9CI) (CA INDEX NAME)

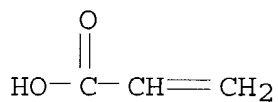
CM 1

CRN 169391-91-7
 CMF C42 H74 O14 Si8



CM 2

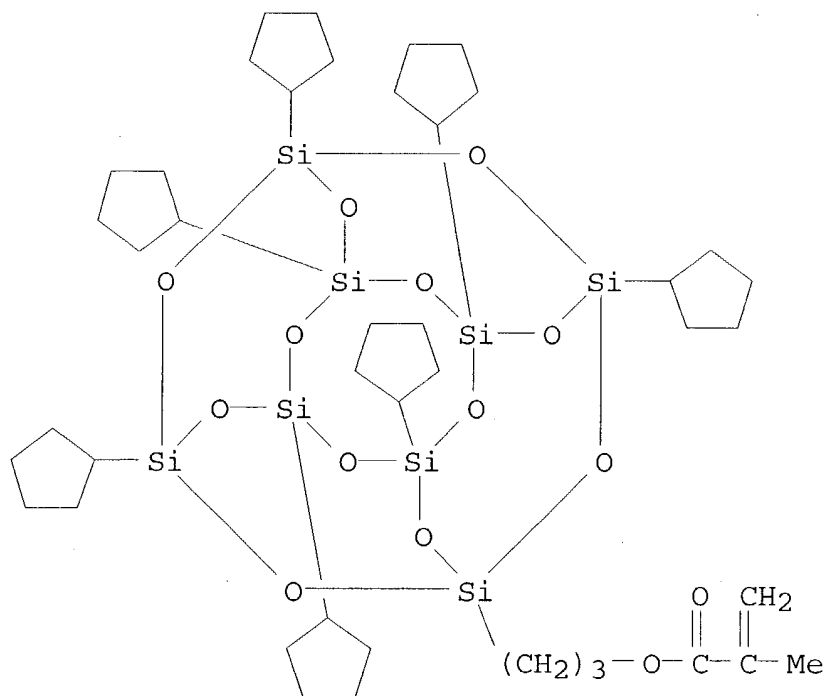
CRN 79-10-7
CMF C3 H4 O2



RN 488760-38-9 HCA
CN 2-Propenoic acid, 2-methyl-, 3-(heptacyclopentylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)propyl ester, polymer with N,N-dimethyl-2-propenamide (9CI) (CA INDEX NAME)

CM 1

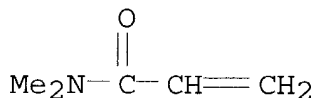
CRN 169391-91-7
CMF C42 H74 O14 Si8



CM 2

CRN 2680-03-7

CMF C5 H9 N O



IT 169699-57-4P 488760-37-8P 488760-38-9P

(synthesis and properties of novel fluoroalkyl end-capped oligomers contg. silsesquioxane segments)

L44 ANSWER 6 OF 25 HCA COPYRIGHT 2003 ACS on STN

137:279967 A low cost method for fabrication of composite materials having three-dimensional wiring pattern. Hiraoka, Toshiro; Hotta, Yasuyuki; Asakawa, Koji; Mataka, Shigeru (Toshiba Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2002285342 A2 20021003, 20 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-92715 20010328.

AB The method comprises steps of: (1) forming a photosensitive layer (A) in the insulator from a photosensitive compd. contg. groups capable of ion-exchanging under energy line and a crosslinkable compd., (2) exposing A under light to form a pattern, (3) further crosslinking A in the exposed part, (4) making metal ions or metal colloids adsorbed in the pattern contg. ion-exchangable groups, and

then (5) on this pattern forming a conductive pattern by performing electroless deposition. Thus, mixing BTTB (a carbperoxoic acid ester) with a copolymer of Me methacrylate and vinylethylene and NKX-653 (a photosensitizer) in a ratio of 10:10:1 in a cyclohexanone-toluene mixt. solvent gave a 1% soln., which was coated on a hydrophilically-treated PTFE porous sheet to give an A, which was then exposed under Ar ion laser light, impregnated in 0.01 M sodium borohydride aq. soln. for 30 min, followed by in 0.5 M aq. CuSO₄ soln. for 30 min, washed, impregnated again in 0.01 M sodium borohydride aq. soln. for 30 min, taken to copper plating (using electroless deposition liq. PS-503 at 25.degree. for 3 h) to give a title material. The composite materials can be useful for electronic devices, e.g., flexible boards, integrated circuits, multilayer wiring boards, etc.

IT 467225-87-2P

(photosensitive layer; fabrication of composite materials having three-dimensional wiring pattern)

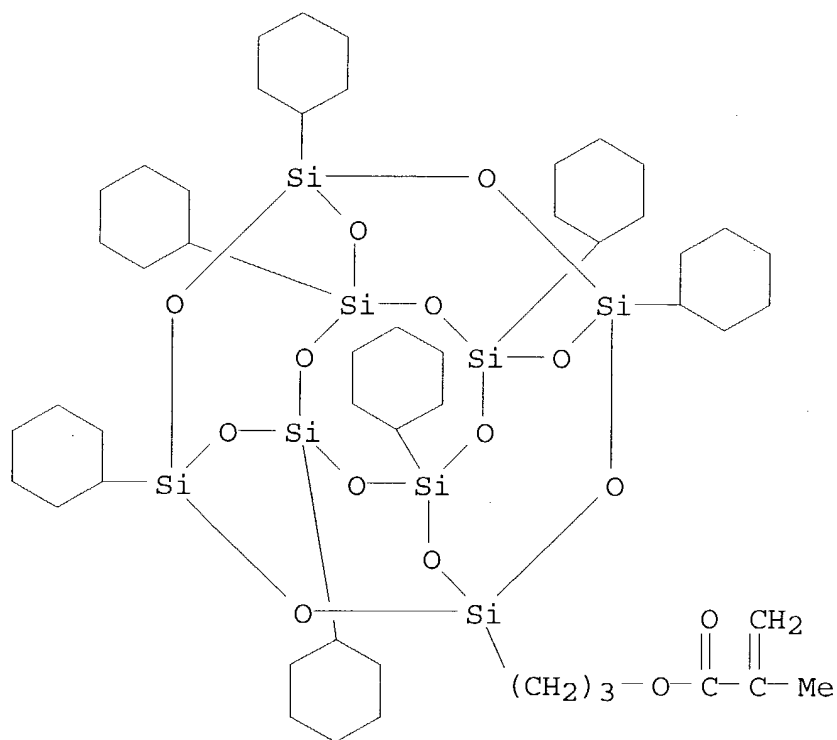
RN 467225-87-2 HCA

CN 2-Propenoic acid, 2-methyl-, 3-(heptacyclohexylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)propyl ester, polymer with tetrahydro-2H-pyran-2-yl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 169391-90-6

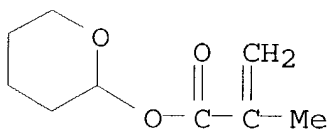
CMF C49 H88 O14 Si8



CM 2

CRN 52858-59-0

CMF C9 H14 O3



IT 467225-87-2P

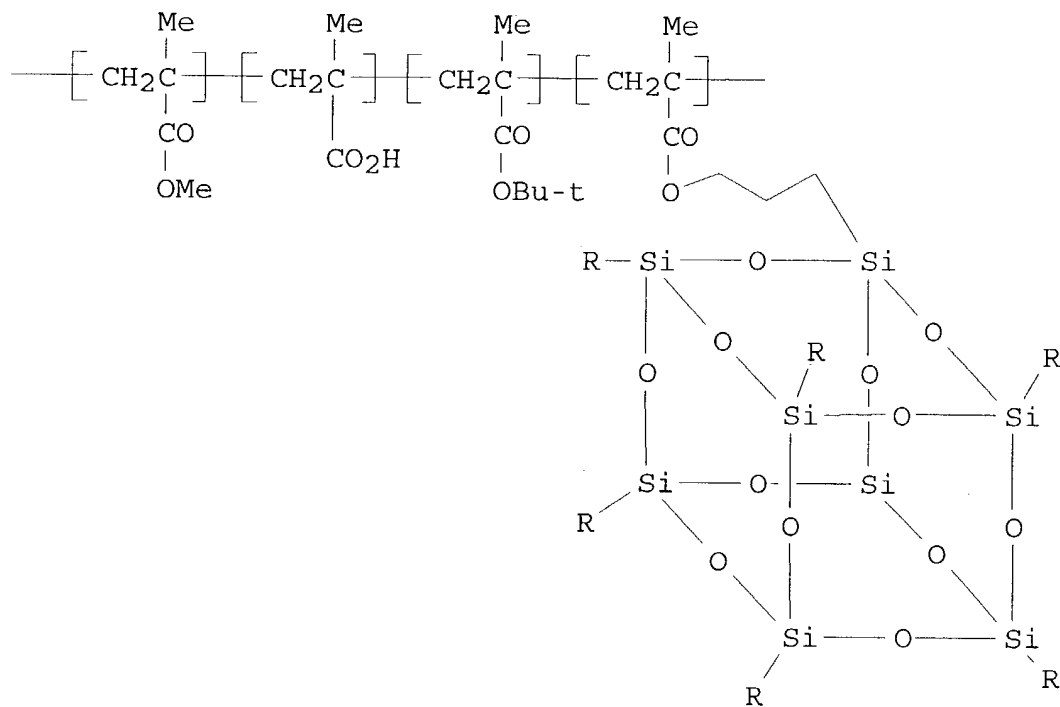
(photosensitive layer; fabrication of composite materials having three-dimensional wiring pattern)

L44 ANSWER 7 OF 25 HCA COPYRIGHT 2003 ACS on STN

137:270509 High resolution resists comprising nanoparticles and inorganic moieties for next generation lithographies. Gonsalves, Kenneth E. (University of North Carolina at Charlotte, USA; University of Connecticut). PCT Int. Appl. WO 2002073308 A1 20020919, 62 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,

MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2002-US7338 20020311. PRIORITY: US 2001-PV274719 20010312.

GI



I

AB The present invention provides new high resolu. resists applicable to next generation lithogs., methods of making these novel resists, and methods of using these new resists in lithog. processes to effect state-of-the-art lithogs. New nanocomposite resists comprising polymers of the general formula I (R = alkyl, cycloalkyl, silyl, aryl, aralkyl, alkenyl) and nanoparticles in a polymer matrix are provided in the invention. New chem. amplified resists that incorporate inorg. moieties as part of the polymer and chem. amplified resists that incorporate photoacid generating groups within the polymeric chain are presented. Novel non-chem. amplified yet photosensitive resists, and new org.-inorg. hybrid resists are also provided. This invention and the embodiments described constitute fundamentally new architectures for high resolu. resists that achieve high sensitivity, contrast, resolu. and high plasma etch resistance.

IT 352455-55-1P 362675-17-0P 461699-74-1P

(chem. amplified resists comprising copolymers with sulfonium photoacid generator monomer)

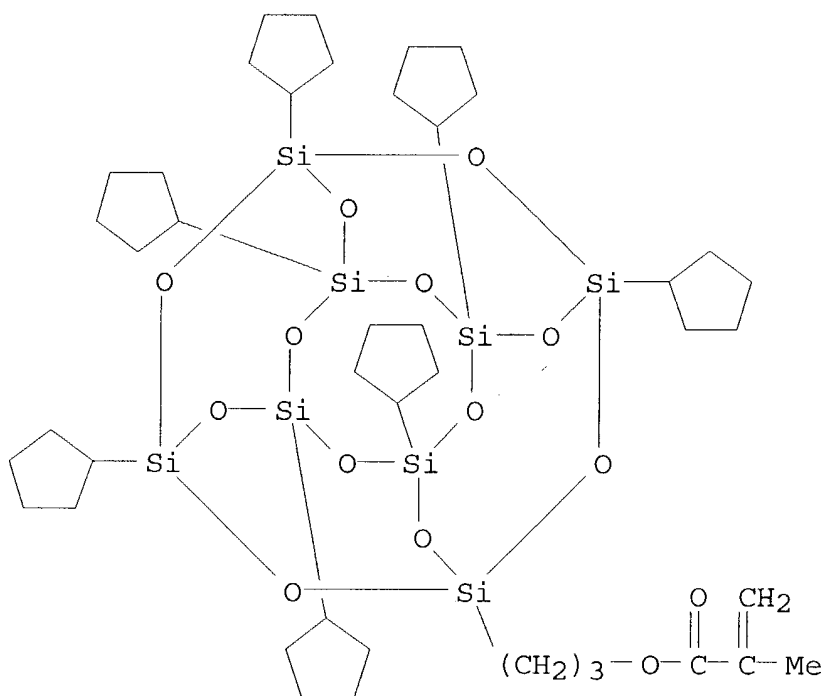
RN 352455-55-1 HCA

CN Sulfonium, dimethyl[4-[(2-methyl-1-oxo-2-propenyl)oxy]phenyl]-, salt with trifluoromethanesulfonic acid (1:1), polymer with 1,1-dimethylethyl 2-methyl-2-propenoate and 3-(heptacyclopentylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)propyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 169391-91-7

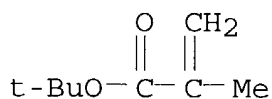
CMF C42 H74 O14 Si8



CM 2

CRN 585-07-9

CMF C8 H14 O2

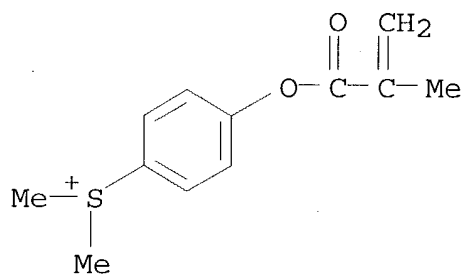


CM 3

CRN 352455-54-0
 CMF C12 H15 O2 S . C F3 O3 S

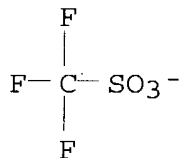
CM 4

CRN 141718-72-1
 CMF C12 H15 O2 S



CM 5

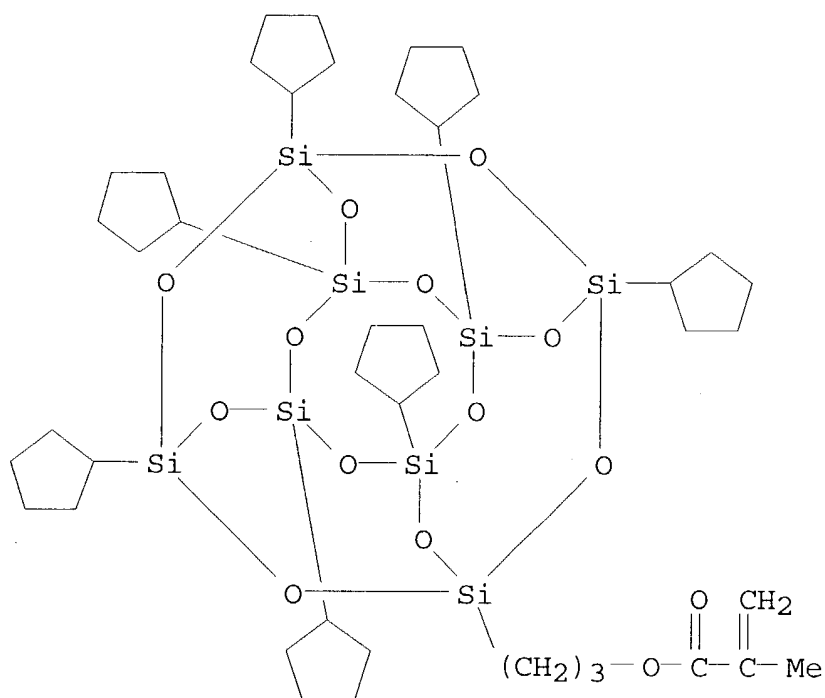
CRN 37181-39-8
 CMF C F3 O3 S



RN 362675-17-0 HCA
 CN Sulfonium, dimethyl[4-[(2-methyl-1-oxo-2-propenyl)oxy]phenyl]-, salt with trifluoromethanesulfonic acid (1:1), polymer with dihydro-3-methylene-2,5-furandione, 1,1-dimethylethyl 2-methyl-2-propenoate, 3-(heptacyclopentylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)propyl 2-methyl-2-propenoate and methyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

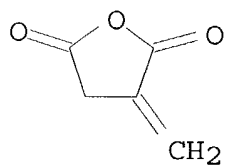
CRN 169391-91-7
 CMF C42 H74 O14 Si8



CM 2

CRN 2170-03-8

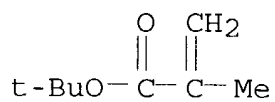
CMF C5 H4 O3



CM 3

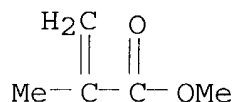
CRN 585-07-9

CMF C8 H14 O2



CM 4

CRN 80-62-6
CMF C5 H8 O2

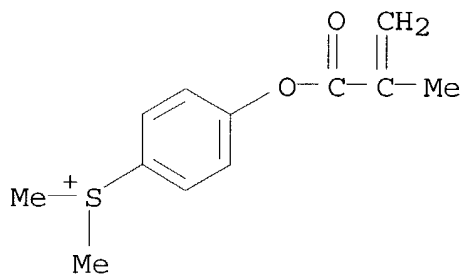


CM 5

CRN 352455-54-0
CMF C12 H15 O2 S . C F3 O3 S

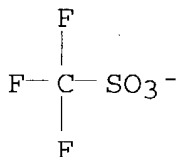
CM 6

CRN 141718-72-1
CMF C12 H15 O2 S



CM 7

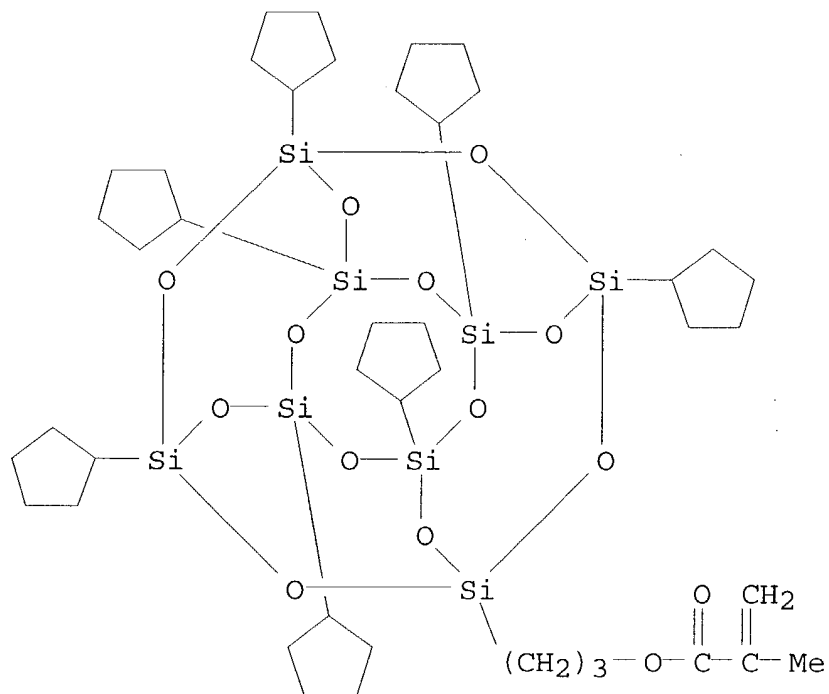
CRN 37181-39-8
CMF C F3 O3 S



RN 461699-74-1 HCA
CN Sulfonium, dimethyl[4-[(2-methyl-1-oxo-2-propenyl)oxy]phenyl]-, salt with trifluoromethanesulfonic acid (1:1), polymer with 1,1-dimethylethyl 2-methyl-2-propenoate, 3-(heptacyclopentylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)propyl 2-methyl-2-propenoate, methyl 2-methyl-2-propenoate and 2-methyl-2-propenoic acid (9CI) (CA INDEX NAME)

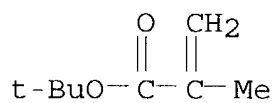
CM 1

CRN 169391-91-7
CMF C42 H74 O14 Si8



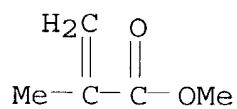
CM 2

CRN 585-07-9
CMF C8 H14 O2



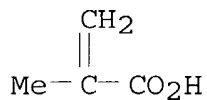
CM 3

CRN 80-62-6
CMF C5 H8 O2



CM 4

CRN 79-41-4
CMF C4 H6 O2

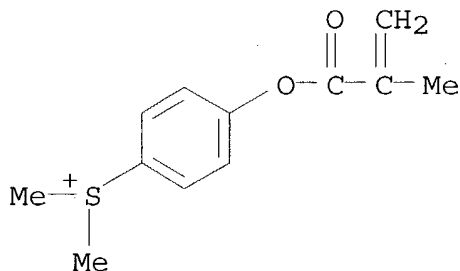


CM 5

CRN 352455-54-0
CMF C12 H15 O2 S . C F3 O3 S

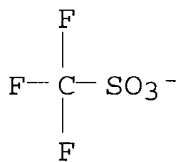
CM 6

CRN 141718-72-1
CMF C12 H15 O2 S



CM 7

CRN 37181-39-8
CMF C F3 O3 S



IT 359408-40-5P

(chem. amplified resists comprising polyhydral
oligosilsesquioxanes, nanoparticles and inorg. moieties)

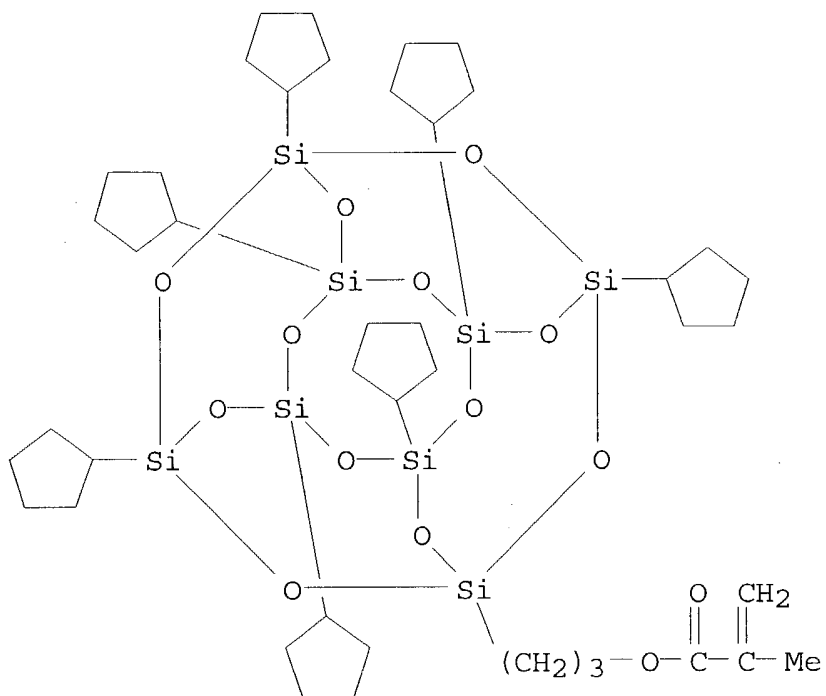
RN 359408-40-5 HCA

CM 2-Propenoic acid, 2-methyl-, polymer with 1,1-dimethylethyl
2-methyl-2-propenoate, 3-(heptacyclopentylpentacyclo[9.5.1.13,9.15,1
5.17,13]octasiloxanyl)propyl 2-methyl-2-propenoate and methyl
2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 169391-91-7

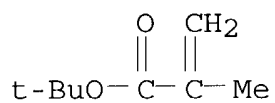
CMF C42 H74 O14 Si8



CM 2

CRN 585-07-9

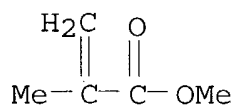
CMF C8 H14 O2



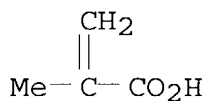
CM 3

CRN 80-62-6

CMF C5 H8 O2



CM 4

CRN 79-41-4
CMF C4 H6 O2

IT 352455-55-1P 362675-17-0P 461699-74-1P

(chem. amplified resists comprising copolymers with sulfonium photoacid generator monomer)

IT 359408-40-5P

(chem. amplified resists comprising polyhydryl oligosilsesquioxanes, nanoparticles and inorg. moieties)

L44 ANSWER 8 OF 25 HCA COPYRIGHT 2003 ACS on STN

137:263738 Effect of Methyl Methacrylate/Polyhedral Oligomeric Silsesquioxane Random Copolymers in Compatibilization of Polystyrene and Poly(methyl methacrylate) Blends. Zhang, Wenhua; Fu, Bruce X.; Seo, Y.; Schrag, Eric; Hsiao, B.; Mather, Patrick; Yang, Nan-Loh; Xu, Dayi; Ade, Harald; Rafailovich, Miriam; Sokolov, Jonathan (Department of Materials Science and Engineering, SUNY, Stony Brook, NY, 11794, USA). Macromolecules, 35(21), 8029-8038 (English) 2002. CODEN: MAMOBX. ISSN: 0024-9297. Publisher: American Chemical Society.

AB Random copolymers of Me methacrylate with polyhedral oligomeric silsesquioxane (POSS) were synthesized and blended with PS and PMMA homopolymer thin films. The effects of the POSS on phase segregation were studied using a variety of complementary techniques. The results showed these copolymers were efficient at compatibilizing immiscible polymer blends. Compatibilization occurred when the POSS was grafted onto the backbone and a favorable interaction existed between the POSS functional groups and the PS homopolymers. The consequences of this compatibilization were studied using a comprehensive array of characterization methods and found to be as follows: reduced domain size, increased interfacial width, and greatly improved fracture toughness. This compatibilization is due to the increased site functionality provided by the POSS mol. without the entropic penalty assocd. with introducing functionalities via grafting directly onto the polymer chains.

IT 302347-58-6

(compatibilizer; effect of Me methacrylate-polyhedral oligomeric silsesquioxane random copolymers in compatibilization of polystyrene-poly(Me methacrylate) blends)

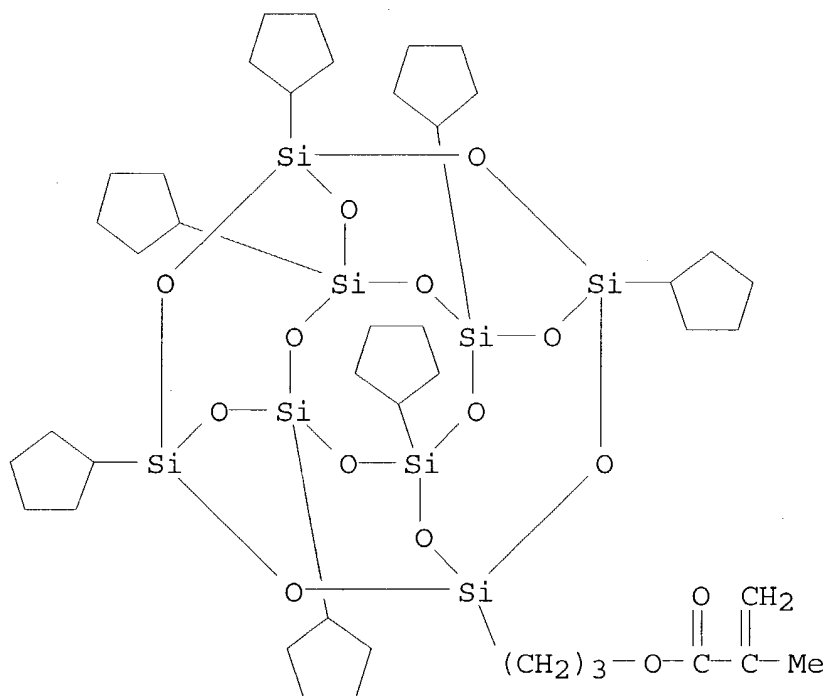
RN 302347-58-6 HCA

CN 2-Propenoic acid, 2-methyl-, 3-(heptacyclopentylpentacyclo[9.5.1.13, 9.15,15.17,13]octasiloxanyl)propyl ester, polymer with methyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 169391-91-7

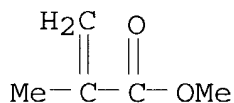
CMF C42 H74 O14 Si8



CM 2

CRN 80-62-6

CMF C5 H8 O2



IT 302347-58-6

(compatibilizer; effect of Me methacrylate-polyhedral oligomeric silsesquioxane random copolymers in compatibilization of polystyrene-poly(Me methacrylate) blends)

L44 ANSWER 9 OF 25 HCA COPYRIGHT 2003 ACS on STN

137:20623 Copolymers of MMA and polyhedral oligosilsesquioxanes (POSS) with thermal property enhancements. Xiao, Jun; Feher, Frank J. (Dep. Chem., Univ. California, Irvine, CA, 92697-2025, USA). Polymer Preprints (American Chemical Society, Division of Polymer Chemistry), 43(1), 504-505 (English) 2002. CODEN: ACPPAY. ISSN:

0032-3934. Publisher: American Chemical Society, Division of Polymer Chemistry.

AB Copolymers of Me methacrylate and polyhedral oligosilsesquioxanes POSS were synthesized and the reactivity ratios of the two comonomers were calcd. POSS showed high reactivity when it copolymd. with Me methacrylate. Thermal property measurements indicate that incorporation of POSS into PMMA can increase the glass transition temp. and thermal decompn. temp. dramatically. These thermal property enhancements were contributed to the rigid Ph groups of POSS and its inorg. core.

IT 433969-21-2P

(reactivity ratios of MMA and polyhedral oligosilsesquioxanes copolymn. and resulting polymer thermal properties)

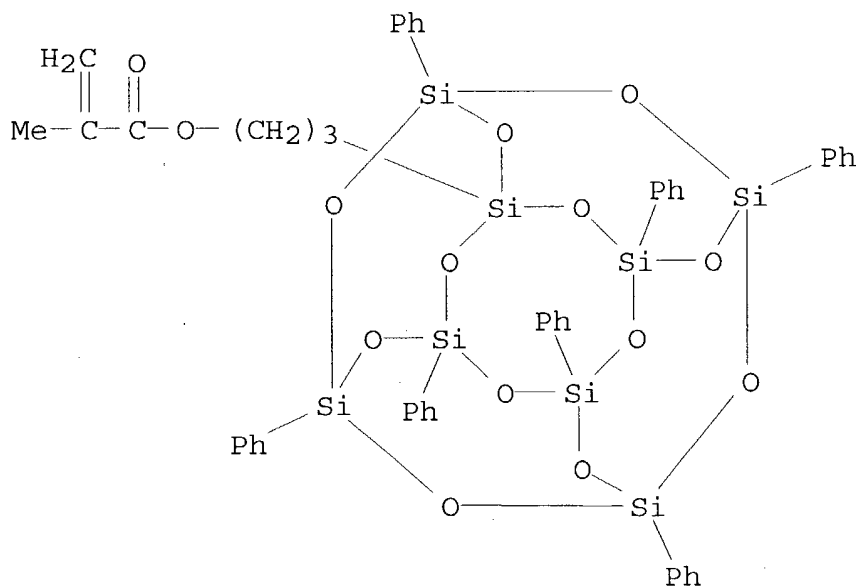
RN 433969-21-2 HCA

CN 2-Propenoic acid, 2-methyl-, 3-(heptaphenylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)propyl ester, polymer with methyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 433969-20-1

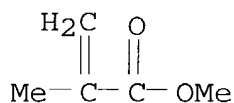
CMF C49 H46 O14 Si8



CM 2

CRN 80-62-6

CMF C5 H8 O2



IT 433969-21-2P

(reactivity ratios of MMA and polyhedral oligosilsesquioxanes copolymn. and resulting polymer thermal properties)

L44 ANSWER 10 OF 25 HCA COPYRIGHT 2003 ACS on STN

136:370435 Thermal properties and morphology of POSS/PMMA hybrids prepared by copolymerization and blending. Xiao, Jun; Feher, Frank J. (Dep. Chem., Univ. California, Irvine, CA, 92697-2025, USA). Polymeric Materials Science and Engineering, 86, 171-172 (English) 2002. CODEN: PMSEGD. ISSN: 0743-0515. Publisher: American Chemical Society. ✓

AB Hybrids contg. polyhedral oligosilsesquioxanes (POSS) have attracted considerable attention because the incorporation of POSS into traditional org. polymer resins often leads to useful property enhancements. Two common methods used to produce POSS-contg. hybrids were copolymn. of functionalized POSS monomers with MMA, and blending of POSS with molten thermoplastics. In this paper, we use both methods to synthesize and characterize POSS/PMMA hybrids contg. up to 30 wt. % POSS. A detailed anal. of the differential scanning calorimetry (DSC) and SEM data indicate that compatibility and miscibility play an important role in detg. the phys. characteristics of POSS-contg. hybrids.

IT 425409-07-0P 425409-08-1P

(thermal properties and morphol. of POSS/PMMA hybrids prep'd. by copolymn. and blending)

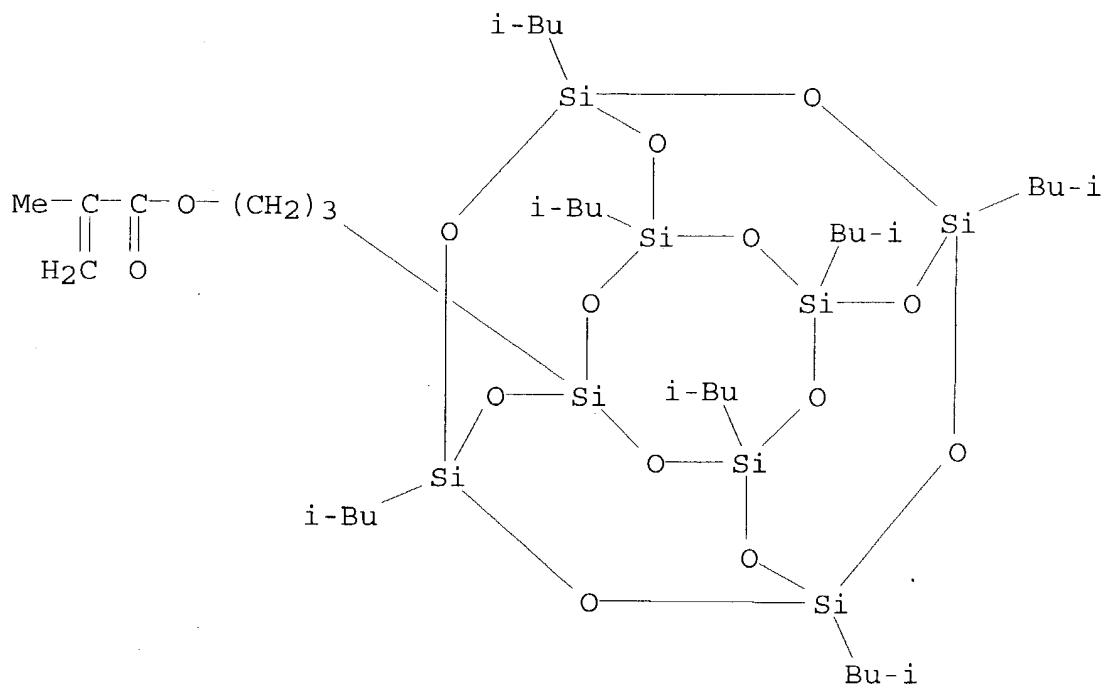
RN 425409-07-0 HCA

CN 2-Propenoic acid, 2-methyl-, 3-[heptakis(2-methylpropyl)pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl]propyl ester, polymer with methyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 307531-94-8

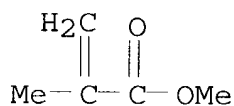
CMF C35 H74 O14 Si8



CM 2

CRN 80-62-6

CMF C5 H8 O2



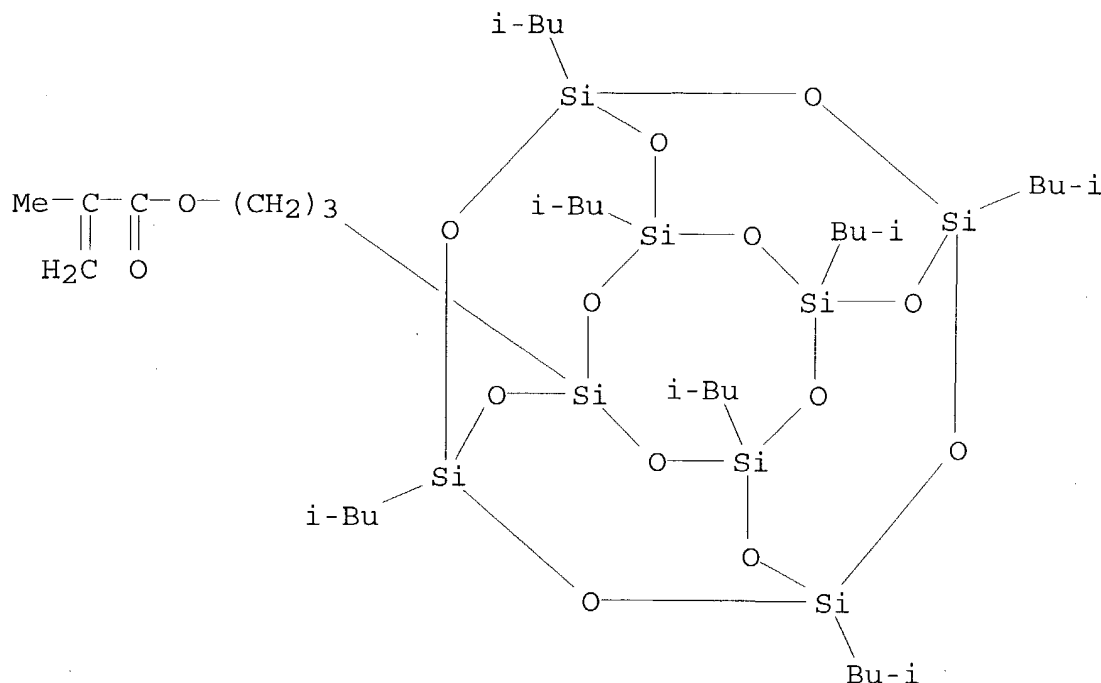
RN 425409-08-1 HCA

CN 2-Propenoic acid, 2-methyl-, 3-[heptakis(2-methylpropyl)pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl]propyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 307531-94-8

CMF C35 H74 O14 Si8



IT 425409-07-0P 425409-08-1P

(thermal properties and morphol. of POSS/PMMA hybrids prepd. by copolymn. and blending)

L44 ANSWER 11 OF 25 HCA COPYRIGHT 2003 ACS on STN

136:110029 Novel CA resists with photoacid generator in polymer chain. Wu, Hengpeng; Gonsalves, Kenneth E. (Polymer Program at the Institute of Materials Science & Department of Chemistry, University of Connecticut, Storrs, CT, 06269, USA). Proceedings of SPIE-The International Society for Optical Engineering, 4345(Pt. 1, Advances in Resist Technology and Processing XVIII), 521-527 (English) 2001. CODEN: PSISDG. ISSN: 0277-786X. Publisher: SPIE-The International Society for Optical Engineering.

AB Novel chem. amplified (CA) resists with photoacid generating units in the polymer chains were synthesized and their lithog. properties evaluated under both 248 nm and 20 keV electron beam exposures. The pos.-tone CA resists were found to exhibit excellent film formation behavior and extremely high sensitivity.

IT 352455-55-1P 362675-17-0P

(prepn. and lithog. characterization of chem. amplified photoresists based on methacrylate polymer contg. sulfonium photoacid generating pendant units)

RN 352455-55-1 HCA

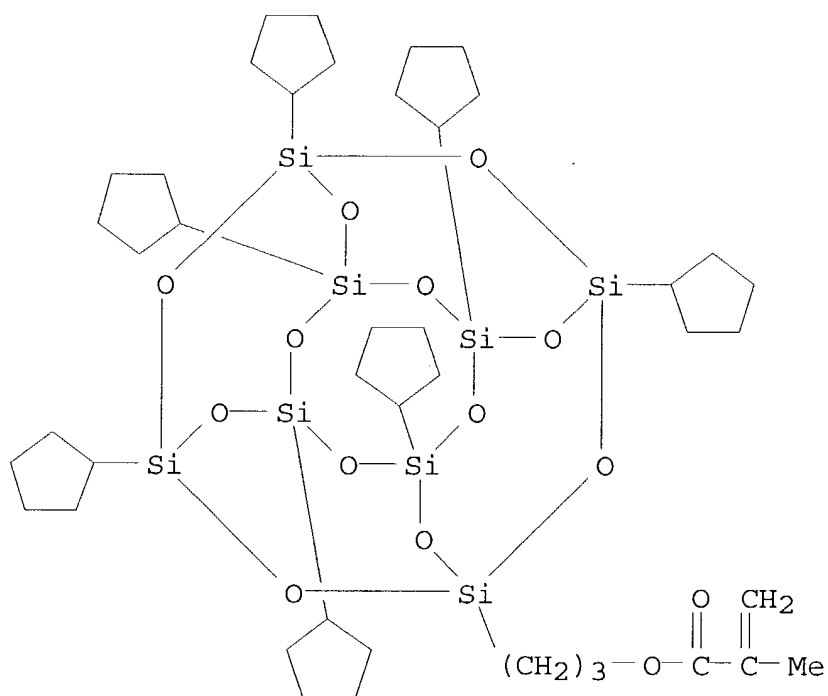
CN Sulfonium, dimethyl[4-[(2-methyl-1-oxo-2-propenyl)oxy]phenyl]-, salt with trifluoromethanesulfonic acid (1:1), polymer with 1,1-dimethylethyl 2-methyl-2-propenoate and 3-(heptacyclopentylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)pro

pyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 169391-91-7

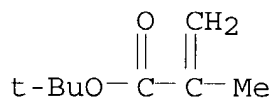
CMF C42 H74 O14 Si8



CM 2

CRN 585-07-9

CMF C8 H14 O2



CM 3

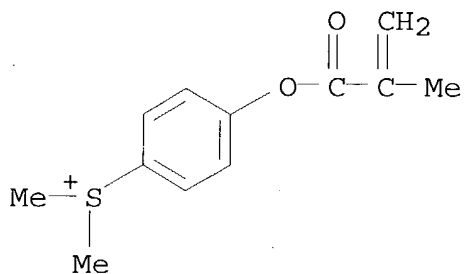
CRN 352455-54-0

CMF C12 H15 O2 S . C F3 O3 S

CM 4

CRN 141718-72-1

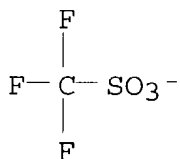
CMF C12 H15 O2 S



CM 5

CRN 37181-39-8

CMF C F3 O3 S



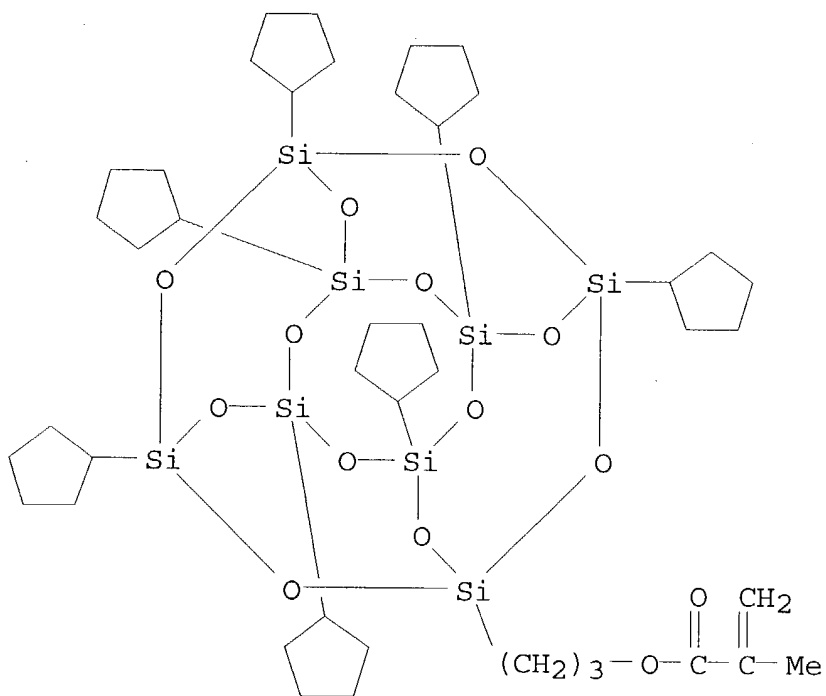
RN 362675-17-0 HCA

CN Sulfonium, dimethyl[4-[(2-methyl-1-oxo-2-propenyl)oxy]phenyl]-, salt with trifluoromethanesulfonic acid (1:1), polymer with dihydro-3-methylene-2,5-furandione, 1,1-dimethylethyl 2-methyl-2-propenoate, 3-(heptacyclopentylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)propyl 2-methyl-2-propenoate and methyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

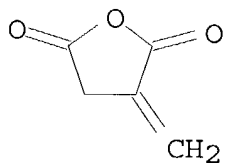
CRN 169391-91-7

CMF C42 H74 O14 Si8



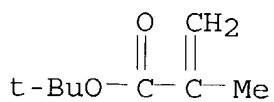
CM 2

CRN 2170-03-8
CMF C5 H4 O3



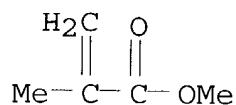
CM 3

CRN 585-07-9
CMF C8 H14 O2



CM 4

CRN 80-62-6
CMF C5 H8 O2

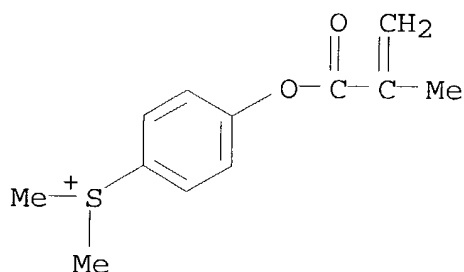


CM 5

CRN 352455-54-0
CMF C12 H15 O2 S . C F3 O3 S

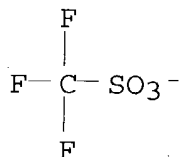
CM 6

CRN 141718-72-1
CMF C12 H15 O2 S



CM 7

CRN 37181-39-8
CMF C F3 O3 S



IT 352455-55-1P 362675-17-0P

(prepn. and lithog. characterization of chem. amplified photoresists based on methacrylate polymer contg. sulfonium photoacid generating pendant units)

L44 ANSWER 12 OF 25 HCA COPYRIGHT 2003 ACS on STN

136:86132 Liquid-crystalline organic-inorganic hybrid polymers with functionalized silsesquioxanes. Kim, Kyung-Min; Chujo, Yoshiki (Department of Polymer Chemistry, Graduate School of Engineering,

Kyoto University, Kyoto, 606-8501, Japan). Journal of Polymer Science, Part A: Polymer Chemistry, 39(22), 4035-4043 (English) 2001. CODEN: JPACEC. ISSN: 0887-624X. Publisher: John Wiley & Sons, Inc..

AB Liq.-cryst. (LC) hybrid polymers with functionalized silsesquioxanes with various proportions of LC monomer were synthesized by the reaction of polyhedral oligomeric silsesquioxane (POSS) macromonomer with methacrylate monomer having an LC moiety under common free-radical conditions. The obtained LC hybrid polymers were sol. in common solvents such as THF, toluene, and chloroform, and their structures were characterized with Fourier transform IR, ¹H NMR, and ²⁹Si NMR. The thermal stability of the hybrid polymers was increased with an increasing ratio of POSS moieties as the inorg. part. Because of the steric hindrance caused by the bulkiness of the POSS macromonomer, the no.-av. mol. wt. of the hybrid polymers gradually decreased as the molar percentage of POSS in the feed increased. Their liq. crystallinities were very dependent on the POSS segments of the hybrid polymers behaving as hard, compact components. The hybrid polymer with 90 mol% LC moiety (Cube-LC90) showed liq. crystallinity, larger glass-transition temps., and better stability with respect to the LC homopolymer. The results of differential scanning calorimetry and optical polarizing microscopy showed that Cube-LC90 had a smectic-mesophase-like fine-grained texture.

IT 387820-82-8P 387820-83-9P

(liq.-cryst. acrylic copolymers with polyhedral silsesquioxane side groups)

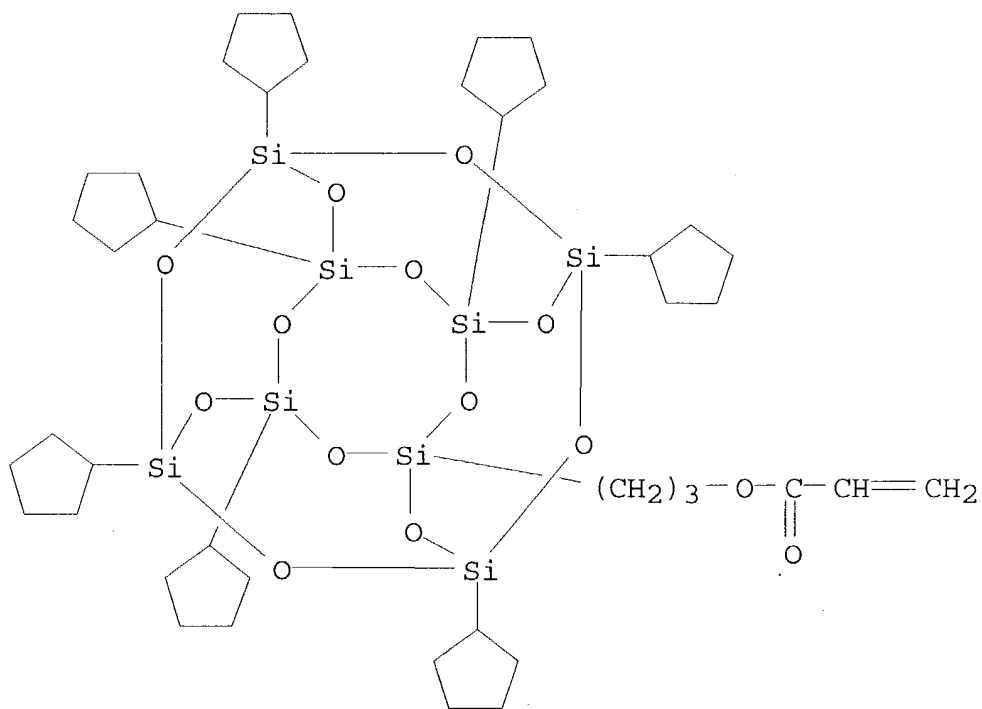
RN 387820-82-8 HCA

CN 2-Propenoic acid, 2-methyl-, 6-[(4'-cyano[1,1'-biphenyl]-4-yl)oxy]hexyl ester, polymer with 3-(heptacyclopentylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)propyl 2-propenoate (9CI) (CA INDEX NAME)

CM 1

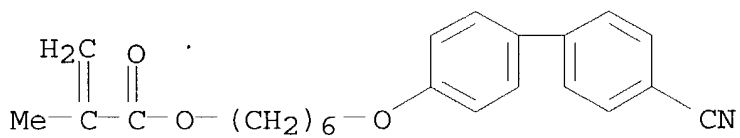
CRN 387820-81-7

CMF C41 H72 O14 Si8



CM 2

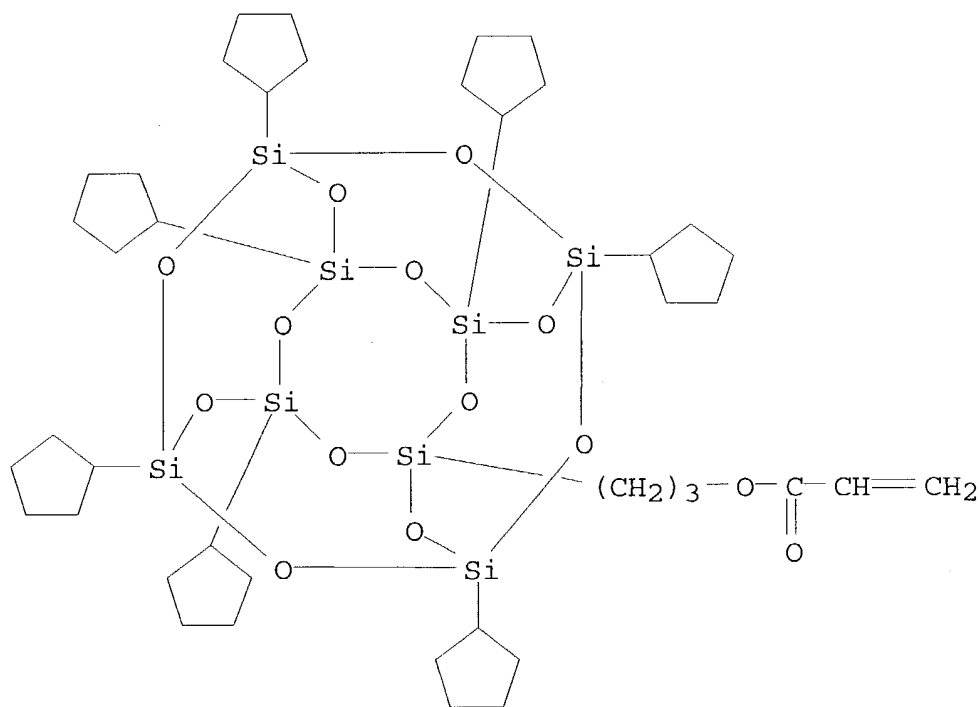
CRN 117318-91-9
 CMF C23 H25 N O3



RN 387820-83-9 HCA
 CN 2-Propenoic acid, 3-(heptacyclopentylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)propyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 387820-81-7
 CMF C41 H72 O14 Si8



IT 387820-82-8P 387820-83-9P

(liq.-cryst. acrylic copolymers with polyhedral silsesquioxane side groups)

L44 ANSWER 13 OF 25 HCA COPYRIGHT 2003 ACS on STN

136:74531 Evaluation of neat resins based on methacrylates modified with methacryl-POSS, as potential organic-inorganic hybrids for formulating dental restoratives. Gao, Feng; Tong, Yuhua; Schricker, Scott R.; Culbertson, Bill M. (College of Dentistry, The Ohio State University, Columbus, OH, 43218-2357, USA). Polymers for Advanced Technologies, 12(6), 355-360 (English) 2001. CODEN: PADTE5. ISSN: 1042-7147. Publisher: John Wiley & Sons Ltd..

AB Three series of neat resins, based on methacrylates or dimethacrylates modified with 1-[3-(methacryl)propyl]-3,5,7,9,11,13,15-heptacyclopentylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane (Methacryl-POSS or POSS-MA), were evaluated. Incorporation of POSS-MA into the polymeric matrix was accomplished in three ways: (a) resins series I was formulated with one-pot copolymer of a bis-GMA/diluent monomer with POSS-MA; (b) the copolymer of 2-hydroxyethyl methacrylate (HEMA) and POSS-MA, with a wt. ratio of 1:1, was first made, then the copolymer hydroxyl groups were converted into methacrylate groups to get a macromer; finally the macromer was copolymerized with bis-GMA/diluents to formulate the second series of neat resins; (c) copolymer of POSS-MA and t-Bu methacrylate (t-BMA) or 2-ethylhexyl methacrylate (EHMA) were first made, then they were combined with a mixture of bis-GMA and the corresponding diluent to make the third kind of neat resins. The

amt. of POSS incorporated into the neat resin matrix was controlled at 5, 10 and 15 wt%. Incorporating only 5 wt% substantially reduced the shrinkage of the prepd. neat resins. The percentage of methacrylate-functionalized POSS monomer in the bis-GMA/diluent base, was compared to neat resins prepd. without the POSS. The mech. properties of neat resin having POSS were improved for approaches (b) and (c), but remained at the same level as the neat resins without POSS for approach (a). The results show that miscibility between the POSS component and the matrix, esp. the diluent, plays a very important role in the improvement of the properties of the formulated thermosets.

IT 279687-80-8P 279687-83-1P 279687-85-3P
384339-56-4P 384340-21-0P

(evaluation of neat dental resins based on methacrylates modified with 1-[3-(methacryl)propyl]-3,5,7,9,11,13,15-heptacyclopentylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane as potential org.-inorg. hybrids)

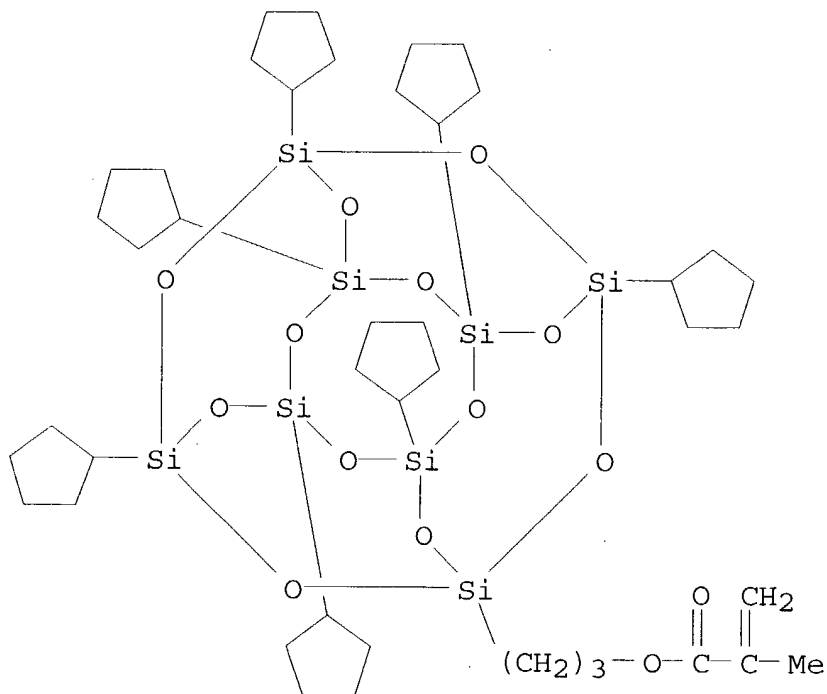
RN 279687-80-8 HCA

CN 2-Propenoic acid, 2-methyl-, 1,6-hexanediyl ester, polymer with 3-(heptacyclopentylpentacyclo[9.5.1.13,?.15,15.17,13]octasiloxanyl)propyl 2-methyl-2-propenoate and (1-methylethylidene)bis[4,1-phenyleneoxy(2-hydroxy-3,1-propanediyl)] bis(2-methyl-2-propenoate) (9CI) (CA INDEX NAME)

CM 1

CRN 169391-91-7

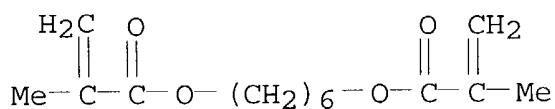
CMF C42 H74 O14 Si8



CM 2

CRN 6606-59-3

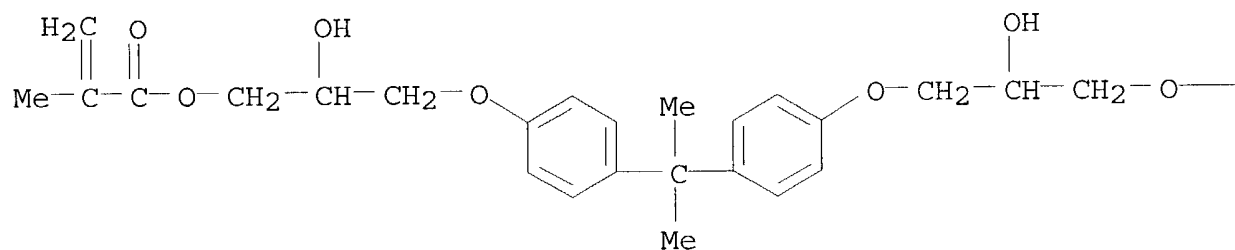
CMF C14 H22 O4



CM 3

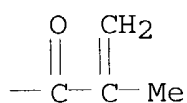
CRN 1565-94-2

CMF C29 H36 O8



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PAGE 1-B



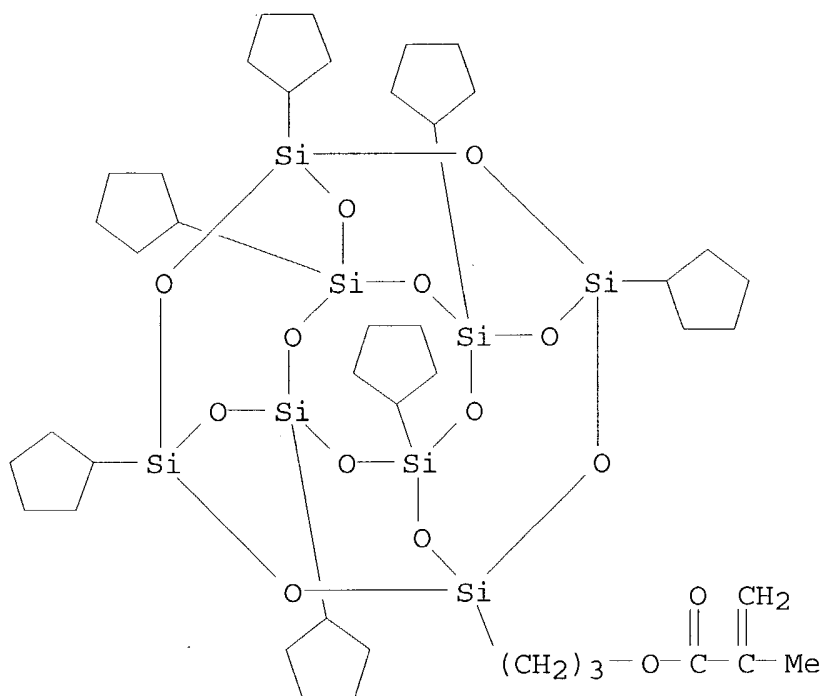
RN 279687-83-1 HCA

CN 2-Propenoic acid, 2-methyl-, (1-methylethylidene)bis[4,1-phenyleneoxy(2-hydroxy-3,1-propanediyl)] ester, polymer with 1,1-dimethylethyl 2-methyl-2-propenoate and 3-(heptacyclopentylpentacyclo[9.5.1.13,?.15,15.17,13]octasiloxanyl)propyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 169391-91-7

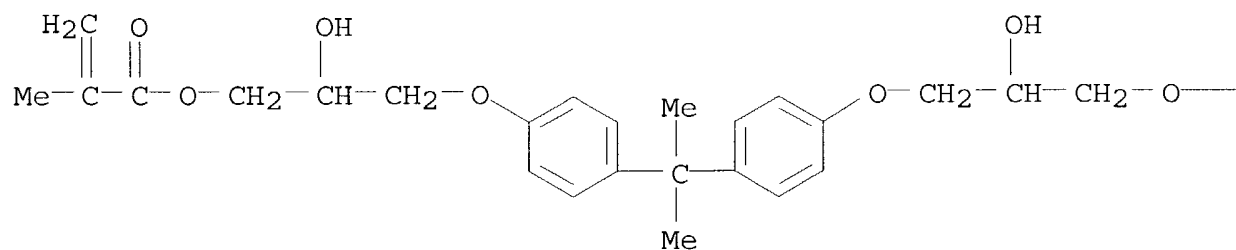
CMF C42 H74 O14 Si8



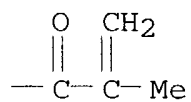
CM 2

CRN 1565-94-2
CMF C29 H36 O8

PAGE 1-A

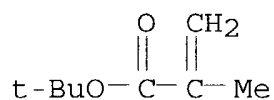


PAGE 1-B



CM 3

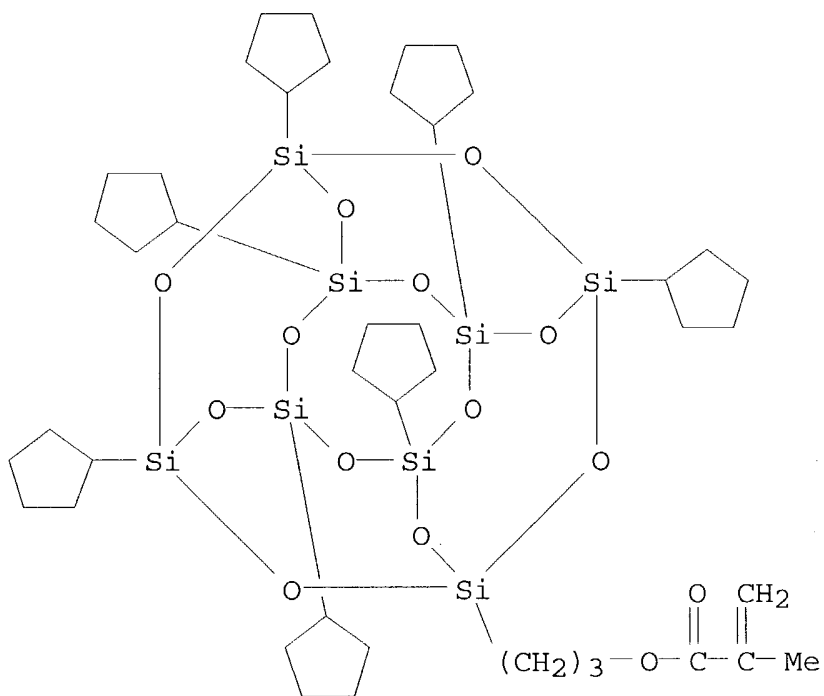
CRN 585-07-9
CMF C8 H14 O2



RN 279687-85-3 HCA
CN 2-Propenoic acid, 2-methyl-, (1-methylethylidene)bis[4,1-phenyleneoxy(2-hydroxy-3,1-propanediyl)] ester, polymer with 2-ethylhexyl 2-methyl-2-propenoate and 3-(heptacyclopentylpentacyclo[9.5.1.13,?.15,15.17,13]octasiloxanyl)propyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

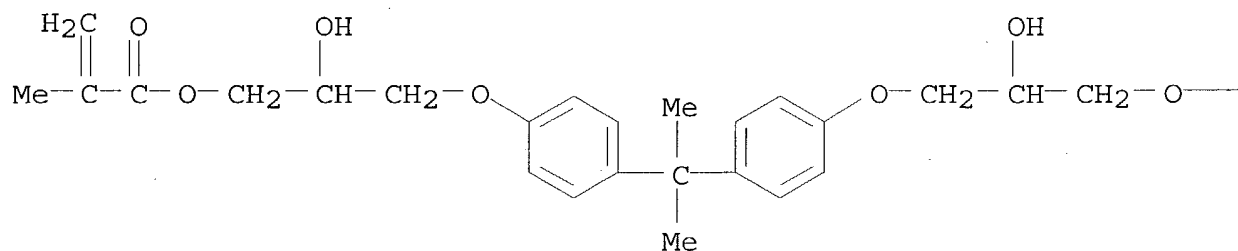
CRN 169391-91-7
CMF C42 H74 O14 Si8



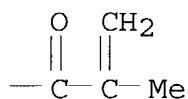
CM 2

CRN 1565-94-2
CMF C29 H36 O8

PAGE 1-A



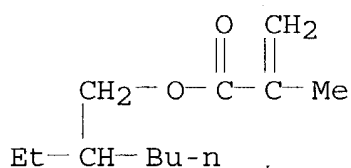
PAGE 1-B



CM 3

CRN 688-84-6

CMF C12 H22 O2



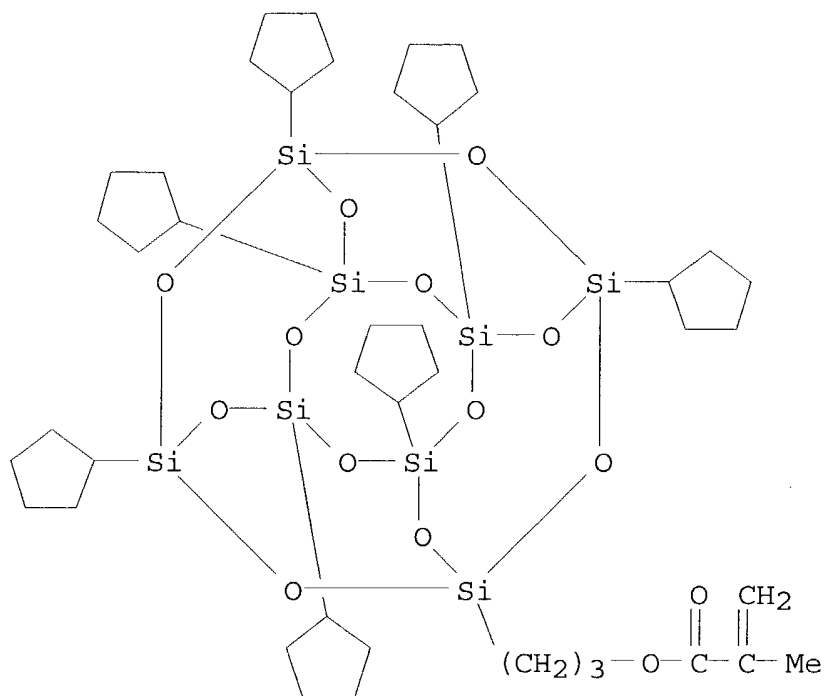
RN 384339-56-4 HCA

CN 2-Propenoic acid, 2-methyl-, 1,6-hexanediyl ester, polymer with
 3-(heptacyclopentylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)p
 ropyl 2-methyl-2-propenoate and .alpha.,.alpha.'-[(1-
 methylethylidene)di-4,1-phenylene]bis[.omega.-[(2-methyl-1-oxo-2-
 propenyl)oxy]poly(oxy-1,2-ethanediyl)] (9CI) (CA INDEX NAME)

CM 1

CRN 169391-91-7

CMF C42 H74 O14 Si8



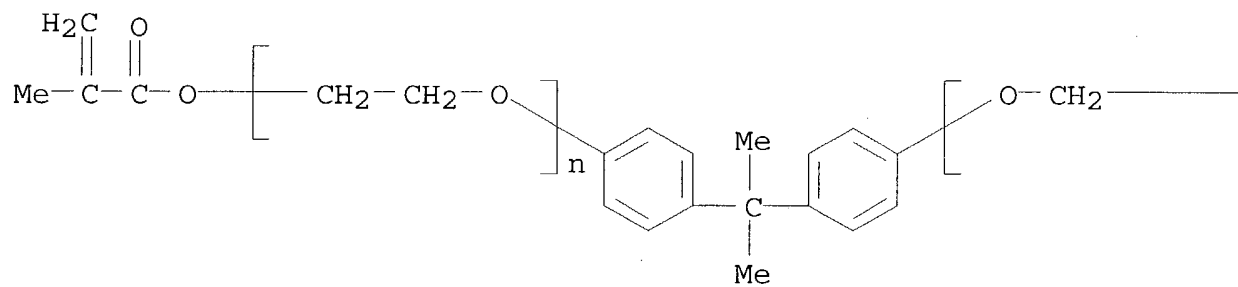
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CRN 41637-38-1

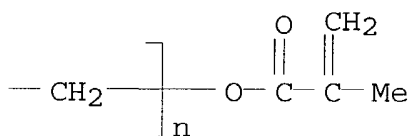
CMF $(\text{C}_2 \text{ H}_4 \text{ O})_n (\text{C}_2 \text{ H}_4 \text{ O})_n \text{C}_{23} \text{H}_{24} \text{O}_4$

CCI PMS

PAGE 1-A



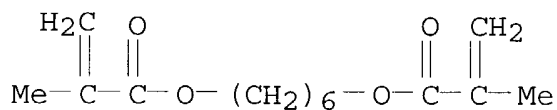
PAGE 1-B



CM 3

CRN 6606-59-3

CMF C14 H22 O4



RN 384340-21-0 HCA

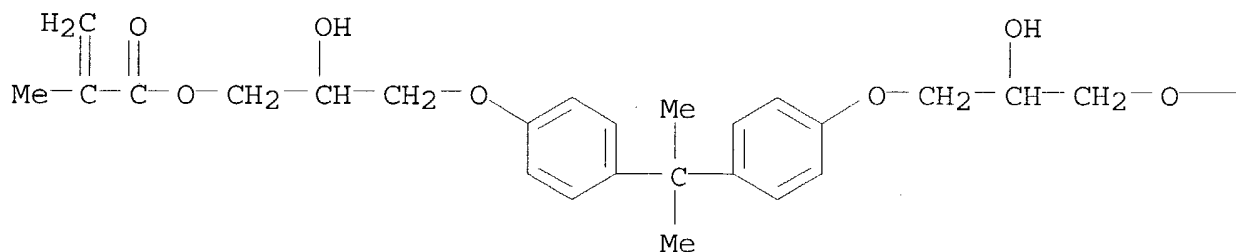
CN 2-Propenoic acid, 2-methyl-, 1,2-ethanediylbis(oxy-2,1-ethanediyl) ester, polymer with 3-(heptacyclopentylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)propyl 2-methyl-2-propenoate polymer with 2-hydroxyethyl 2-methyl-2-propenoate 2-methyl-2-propenoate, and (1-methylethylidene)bis[4,1-phenyleneoxy(2-hydroxy-3,1-propanediyl)] bis(2-methyl-2-propenoate) (9CI) (CA INDEX NAME)

CM 1

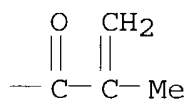
CRN 1565-94-2

CMF C29 H36 O8

PAGE 1-A

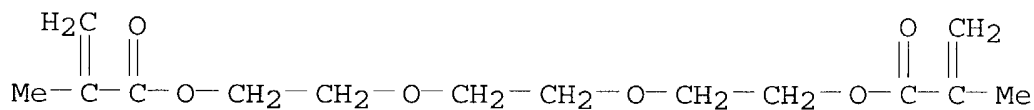


PAGE 1-B



CM 2

CRN 109-16-0
CMF C14 H22 O6

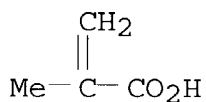


CM 3

CRN 384340-20-9
CMF (C42 H74 O14 Si8 . C6 H10 O3)x . x C4 H6 O2

CM 4

CRN 79-41-4
CMF C4 H6 O2

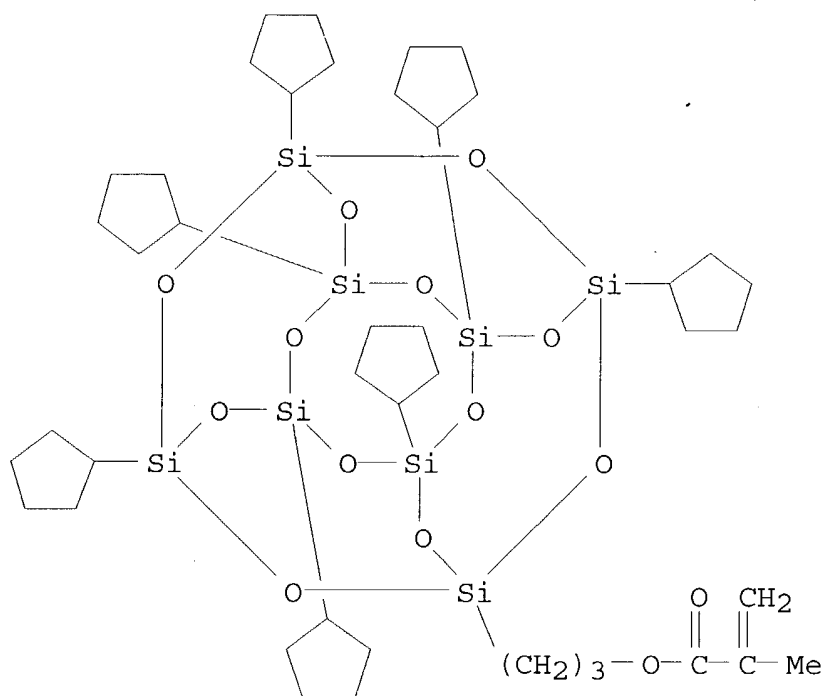


CM 5

CRN 384340-19-6
CMF (C42 H74 O14 Si8 . C6 H10 O3)x
CCI PMS

CM 6

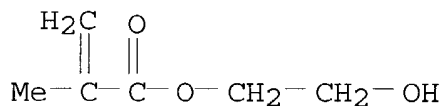
CRN 169391-91-7
CMF C42 H74 O14 Si8



CM 7

CRN 868-77-9

CMF C6 H10 O3



IT 279687-80-8P 279687-83-1P 279687-85-3P

384339-56-4P 384340-21-0P

(evaluation of neat dental resins based on methacrylates modified with 1-[3-(methacryl)propyl]-3,5,7,9,11,13,15-heptacyclopentylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane as potential org.-inorg. hybrids)

L44 ANSWER 14 OF 25 HCA COPYRIGHT 2003 ACS on STN

135:280376 High resolution resists for next generation lithography: the nanocomposite approach. Gonsalves, Kenneth E.; Wu, Hengpeng; Hu, Yongqi; Merhari, Lhadi (Polymer Program at the Institute of Materials Science & Department of Chemistry, University of Connecticut, Storrs, CT, 06268, USA). Materials Research Society Symposium Proceedings, 636(Nonlithographic and Lithographic Methods of Nanofabrication: From Ultralarge-Scale Integration to Photonics

to Molecular Electronics), D6.5/1-D6.5/12 (English) 2001. CODEN: MRSPDH. ISSN: 0272-9172. Publisher: Materials Research Society.

AB Except for ion-beam lithog., deep-UV (DUV), x-ray, and in particular electron-beam lithog. suffer significantly from proximity effects, leading to severe degrdn. of resoln. in classical resists. The authors report a new class of resists based on org./inorg. nanocomposites having a structure that reduces the proximity effects. Synthetic routes are described for a ZEP520/nano-SiO₂ resist where 47 nm wide lines have been written with a 40 nm diam., 20 keV electron beam at no sensitivity cost. Other resist systems based on polyhedral oligosilsesquioxane copolymer with Me methacrylate, tert-Bu methacrylate, methacrylic acid and a proprietary photoacid generator are also presented. These nanocomposite resists suitable for DUV and electron beam lithog. show enhancement in both contrast and RIE resistance in oxygen. Tentative mechanisms responsible for proximity effect redn. are also discussed.

IT 359408-40-5 362675-17-0
(lithog. resists with improved reactive ion etching resistance from methacrylate copolymers containing oligosilsesquioxane pendant)

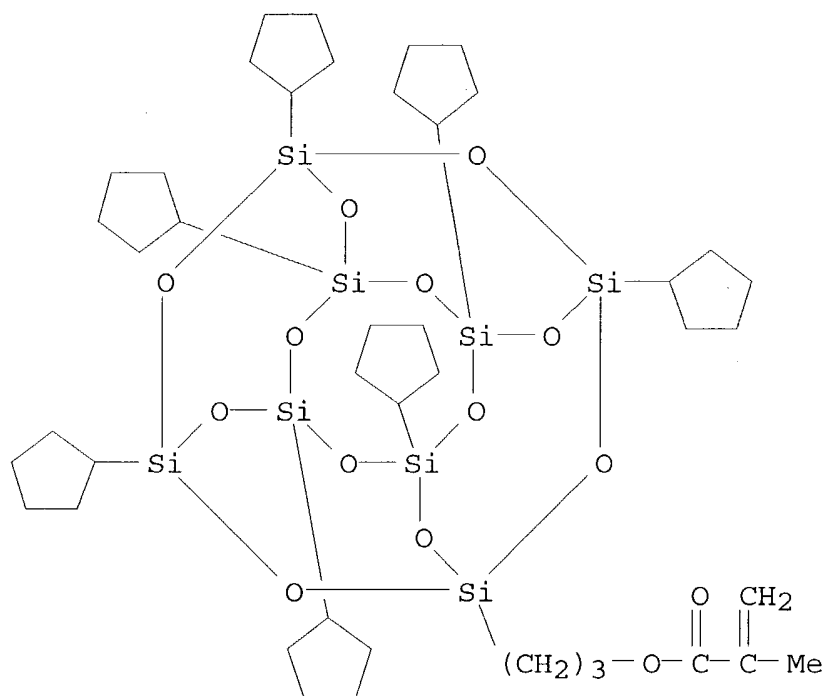
RN 359408-40-5 HCA

CN 2-Propenoic acid, 2-methyl-, polymer with 1,1-dimethylethyl 2-methyl-2-propenoate, 3-(heptacyclopentylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)propyl 2-methyl-2-propenoate and methyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

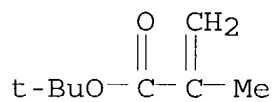
CRN 169391-91-7

CMF C42 H74 O14 Si8



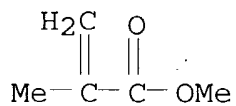
CM 2

CRN 585-07-9
CMF C8 H14 O2



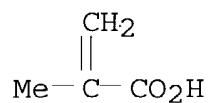
CM 3

CRN 80-62-6
CMF C5 H8 O2



CM 4

CRN 79-41-4
CMF C4 H6 O2



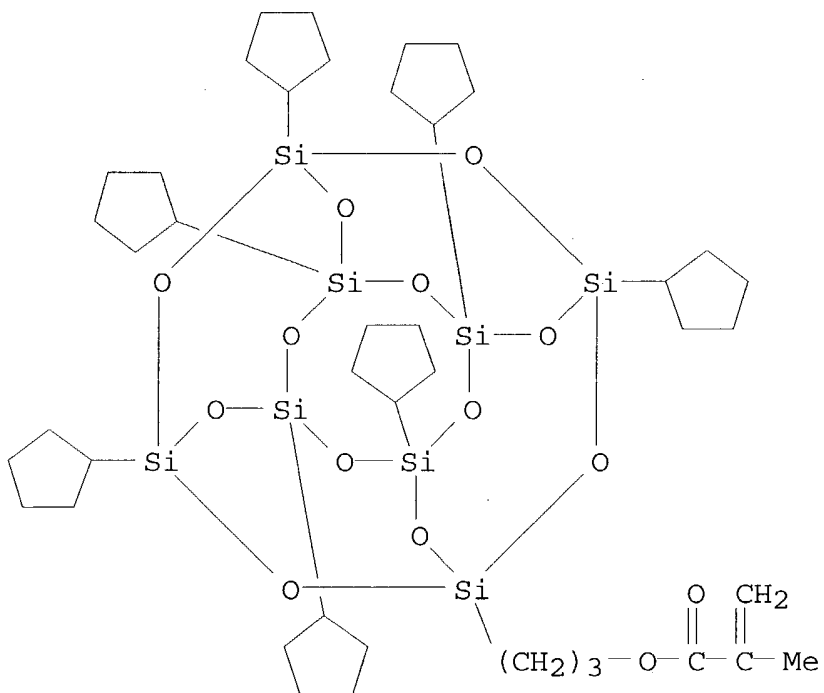
RN 362675-17-0 HCA

CN Sulfonium, dimethyl[4-[(2-methyl-1-oxo-2-propenyl)oxy]phenyl]-, salt with trifluoromethanesulfonic acid (1:1), polymer with dihydro-3-methylene-2,5-furandione, 1,1-dimethylethyl 2-methyl-2-propenoate, 3-(heptacyclopentylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)propyl 2-methyl-2-propenoate and methyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 169391-91-7

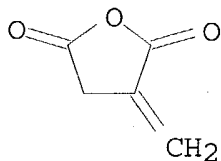
CMF C42 H74 O14 Si8



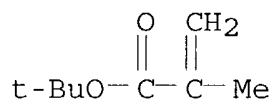
CM 2

CRN 2170-03-8

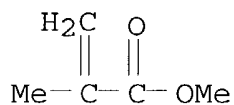
CMF C5 H4 O3



CM 3

CRN 585-07-9
CMF C8 H14 O2

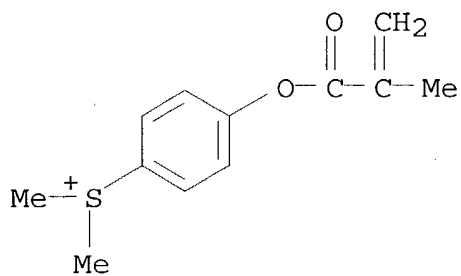
CM 4

CRN 80-62-6
CMF C5 H8 O2

CM 5

CRN 352455-54-0
CMF C12 H15 O2 S . C F3 O3 S

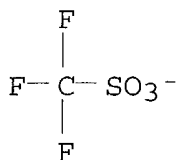
CM 6

CRN 141718-72-1
CMF C12 H15 O2 S

CM 7

CRN 37181-39-8

CMF C F3 O3 S



IT 359408-40-5 362675-17-0

(lithog. resists with improved reactive ion etching resistance from methacrylate copolymers contg. oligosilsesquioxane pendant)

L44 ANSWER 15 OF 25 HCA COPYRIGHT 2003 ACS on STN

135:243298 Ionic conduction membrane for solid polymeric fuel cell and its manufacture. Arimura, Tomoaki (Nippon Jidosha Kenkyusho, Japan). Jpn. Kokai Tokkyo Koho JP 2001247741 A2 20010911, 11 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-63758 20000308.

AB Title ionic conduction membrane has methanol impermeability, heat resistance, high mech. strength, and low prodn. cost and is a composite film of a fiber material and a polymer resin comprising an arom. monomer, an ionically conductive monomer, a high-vol. monomer, and a crosslinking agent. The arom. monomer typically is an arom. vinyl monomer; the ionically conductive monomer is a vinyl monomer having an acid group; the high-vol. monomer is a cage-type monomer formed through bonds such as Si-O, Si-C, and C-C; the crosslinking agent contains arom. ring. The membrane is manufd. by impregnating the fiber material in the monomer soln. followed by polymn.

IT 360054-98-4P

(ionic conduction membrane for solid polymeric fuel cell and its manuf.)

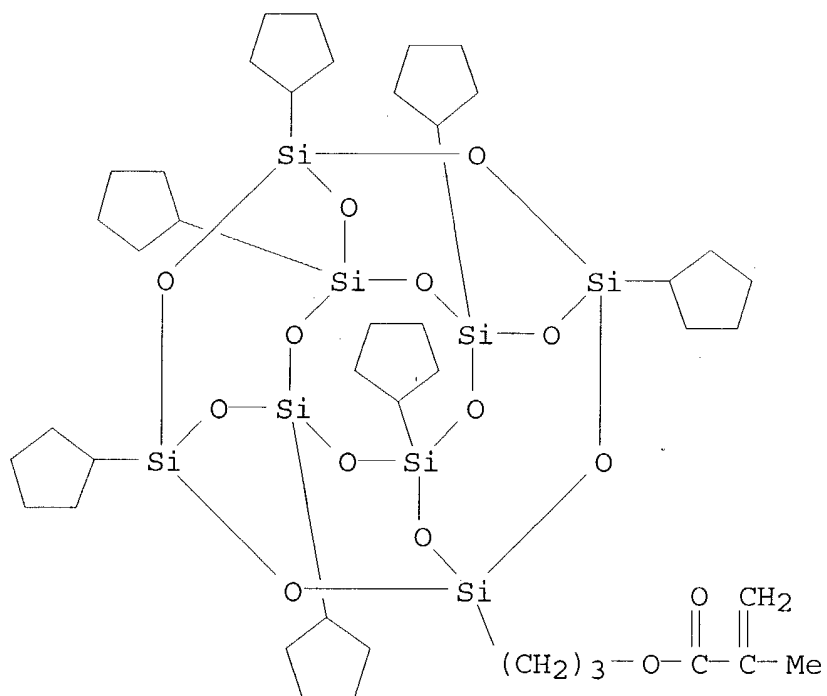
RN 360054-98-4 HCA

CN 2-Propenoic acid, 2-methyl-, 3-(heptacyclopentylpentacyclo[9.5.1.13, 9.15,15.17,13]octasiloxanyl)propyl ester, polymer with (1,1-dimethylethyl)ethenylbenzene, (1-methylethylidene)bis[4,1-phenyleneoxy(2-hydroxy-3,1-propanediyl)] di-2-propenoate and 2-methyl-2-[(1-oxo-2-propenyl)amino]-1-propanesulfonic acid (9CI) (CA INDEX NAME)

CM 1

CRN 169391-91-7

CMF C42 H74 O14 Si8

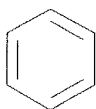


CM 2

CRN 25338-51-6

CMF C12 H16

CCI IDS

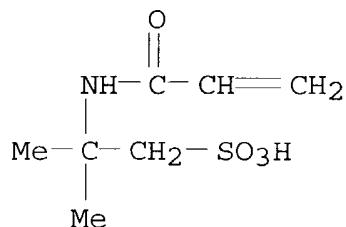
D1-CH=CH₂

D1-Bu-t

CM 3

CRN 15214-89-8

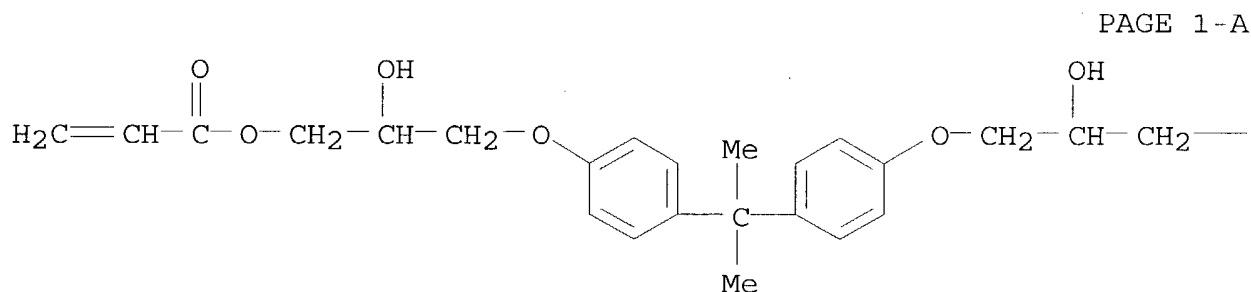
CMF C7 H13 N O4 S



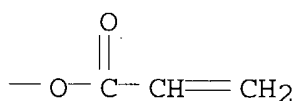
CM 4

CRN 4687-94-9

CMF C27 H32 O8



PAGE 1-B



IT 360054-98-4P

(ionic conduction membrane for solid polymeric fuel cell and its manuf.)

L44 ANSWER 16 OF 25 HCA COPYRIGHT 2003 ACS on STN

135:233765 Incorporation of polyhedral oligosilsesquioxane in chemically amplified resists to improve their reactive ion etching resistance. Wu, Hengpeng; Hu, Yongqi; Gonsalves, Kenneth E.; Yacaman, Miguel Jose (Polymer Program at the Institute of Materials Science and Department of Chemistry, University of Connecticut, Storrs, CT, 06269, USA). Journal of Vacuum Science & Technology, B: Microelectronics and Nanometer Structures, 19(3), 851-855 (English) 2001. CODEN: JVTBD9. ISSN: 0734-211X. Publisher: American Institute of Physics.

AB A chem. amplified (CA) methacrylate resist contg. polyhedral oligosilsesquioxane (POSS) has been synthesized by AIBN-initiated free radical polymn. While the polymer of low POSS concns. showed

little improvement in reactive ion etching (RIE) resistance, incorporation of 20.5 wt.% of the POSS monomer into methacrylate-based CA resists significantly improved their RIE resistance in the O₂ plasma. High-resoln. transmission electron microscopy revealed that the RIE resistance improvement was due to the formation of rectangular crystallite-constituting networks of the silica cages uniformly distributed within the polymer matrix.

IT 359408-40-5P

(incorporation of polyhedral oligosilsesquioxane in chem. amplified resists to improve their reactive ion etching resistance)

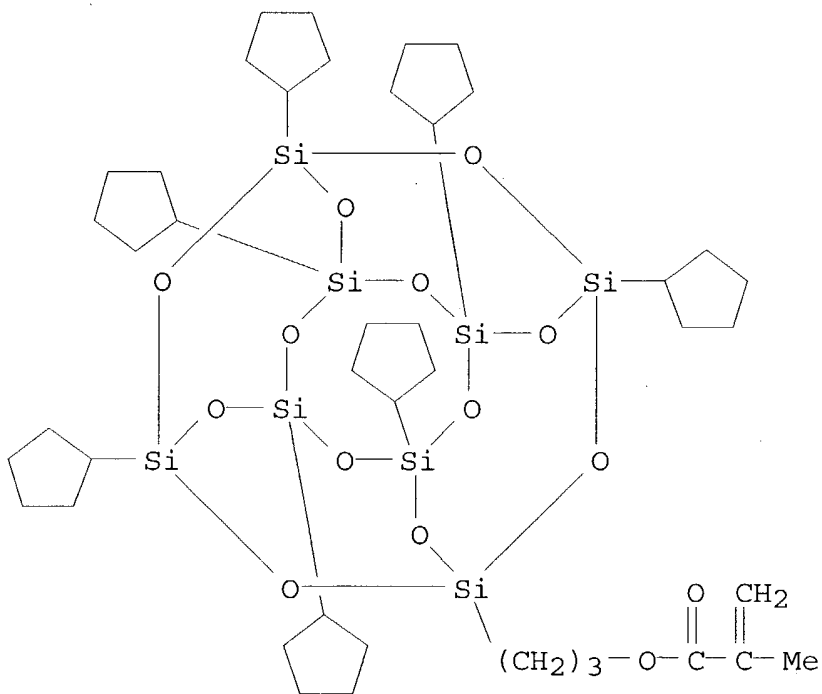
RN 359408-40-5 HCA

CN 2-Propenoic acid, 2-methyl-, polymer with 1,1-dimethylethyl 2-methyl-2-propenoate, 3-(heptacyclopentylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)propyl 2-methyl-2-propenoate and methyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 169391-91-7

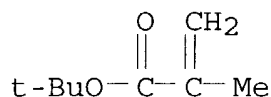
CMF C42 H74 O14 Si8



CM 2

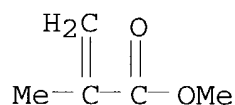
CRN 585-07-9

CMF C8 H14 O2



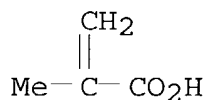
CM 3

CRN 80-62-6
CMF C5 H8 O2



CM 4

CRN 79-41-4
CMF C4 H6 O2



IT 359408-40-5P

(incorporation of polyhedral oligosilsesquioxane in chem. amplified resists to improve their reactive ion etching resistance)

L44 ANSWER 17 OF 25 HCA COPYRIGHT 2003 ACS on STN

135:160082 Novel positive-tone chemically amplified resists with photoacid generator in the polymer chains. Wu, Hengpeng; Gonsalves, Kenneth E. (Polymer Program at the Institute of Materials Science and Department of Chemistry, University of Connecticut, Storrs, CT, 06269, USA). Advanced Materials (Weinheim, Germany), 13(9), 670-672 (English) 2001. CODEN: ADVMEW. ISSN: 0935-9648. Publisher: Wiley-VCH Verlag GmbH.

AB A sulfonium photoacid generating monomer was synthesized using a four-step synthesis scheme. This PAG monomer was successfully incorporated into methacrylate based chem. amplified resists by free radical copolymn. The resists were found to exhibit excellent film formation behavior due to absence of phase sepn., and extremely high sensitivity owing to high PAG loading in the polymer chain. Lithog. properties of the resists were also evaluated under both 248 nm and 20 keV electron radiation. High sensitivity also affords these resists as potential candidates for low voltage EB lithog.

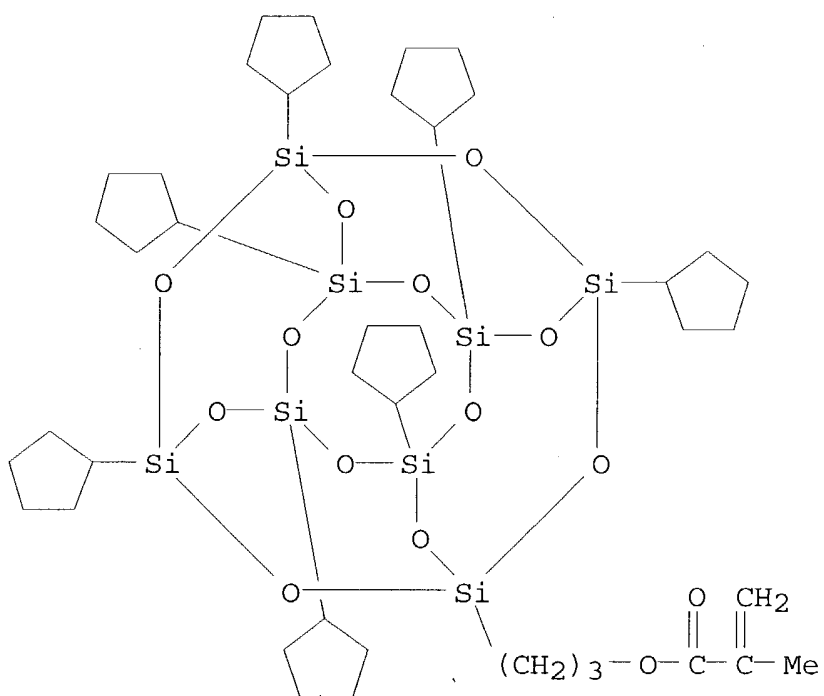
IT 352455-55-1P

(prepn. and lithog. application of methacrylate based chem. amplified resists comprising sulfonium photoacid generating

monomer)
 RN 352455-55-1 HCA
 CN Sulfonium, dimethyl[4-[(2-methyl-1-oxo-2-propenyl)oxy]phenyl]-, salt with trifluoromethanesulfonic acid (1:1), polymer with 1,1-dimethylethyl 2-methyl-2-propenoate and 3-(heptacyclopentylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)propyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

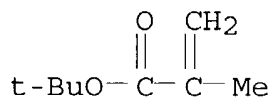
CM 1

CRN 169391-91-7
 CMF C42 H74 O14 Si8



CM 2

CRN 585-07-9
 CMF C8 H14 O2



CM 3

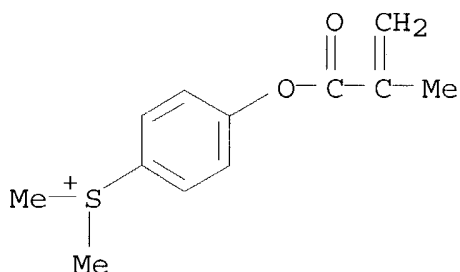
CRN 352455-54-0

CMF C12 H15 O2 S . C F3 O3 S

CM 4

CRN 141718-72-1

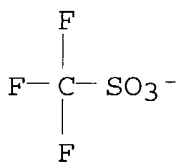
CMF C12 H15 O2 S



CM 5

CRN 37181-39-8

CMF C F3 O3 S



IT 352455-55-1P

(prepn. and lithog. application of methacrylate based chem. amplified resists comprising sulfonium photoacid generating monomer)

L44 ANSWER 18 OF 25 HCA COPYRIGHT 2003 ACS on STN

135:26880 Porous pattern forming material, method for pattern formation using same, and method for manufacture of electrolysis cells, filters, porous carbon materials, capacitor, and catalyst layer of fuel batteries using same. Hiraoka, Toshiro; Asakawa, Koji; Akasaka, Yoshihiro; Hotta, Yasuyuki (Toshiba Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2001151834 A2 20010605, 62 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-169263 20000606. PRIORITY: JP 1999-159479 19990607; JP 1999-262326 19990916.

AB The title material contains a block copolymer or a graft copolymer for forming pattern of a microphase sep. structure, wherein the .gtoreq.2 kinds of the polymer chains of the block copolymer or the graft copolymer has .gtoreq.1.4 of the monomer based N/(Nc-No) where N is total element no. in the monomer, Nc is the no. of carbon in the monomer, and No is the no. of oxygen in the monomer. The method provides the 2- and 3-dimensional pattern in nanometer size with the

simple process.

IT 343253-76-9P

(copolymer for porous pattern forming material)

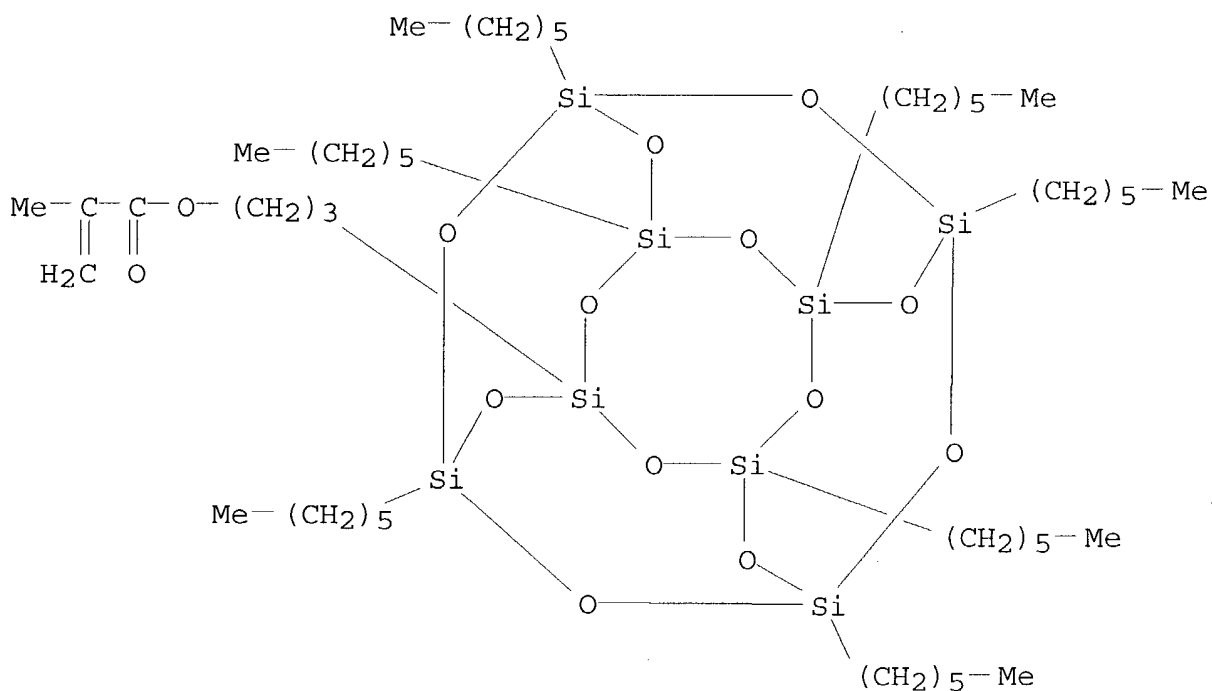
RN 343253-76-9 HCA

CN 2-Propenoic acid, 2-methyl-, 3-(heptahexylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)propyl ester, polymer with ethenylbenzene and oxirane, graft (9CI) (CA INDEX NAME)

CM 1

CRN 343253-75-8

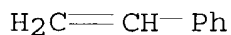
CMF C49 H102 O14 Si8



CM 2

CRN 100-42-5

CMF C8 H8



CM 3

CRN 75-21-8

CMF C2 H4 O



IT 343253-76-9P

(copolymer for porous pattern forming material)

L44 ANSWER 19 OF 25 HCA COPYRIGHT 2003 ACS on STN

133:315501 Polymer-inorganic high contrast and high sensitivity resists for nanolithography. Wu, Hengpeng; Wang, Jianzhao; Gonsalves, Kenneth E. (Polymer Program at the Institute of Materials Science, U-3136 & Department of Chemistry, University of Connecticut, Storrs, CT, 06269-3136, USA). Materials Research Society Symposium (Nov.28-Dec.1, Proceedings, 584 (Materials Issues and Modeling for Device Nanofabrication), 121-128 (English) 2000. CODEN: MRSPDH. ISSN: 0272-9172. Publisher: Materials Research Society. 1999)

AB Polyhedral oligo-silsesquioxane methacrylate (POSSMA)/methyl methacrylate (MMA)/tert-Bu methacrylate (TBMA)/CMe3 acrylate (TBA) copolymers were synthesized by soln. polymn. Their preliminary lithog.-related properties were studied. The mass ratio of MMA/POSSMA, 85.8/14.2, leads to an x-ray resist with a high contrast of 23.5 without sacrificing the sensitivity (1350 mJ/cm²) which remains comparable to that of std. PMMA. By careful manipulation of components and compns., this generic type of polymer could potentially be used as a DUV or e-beam resist as well.

IT 302347-58-6 302347-59-7 302347-60-0

(polymer-inorg. high contrast and high sensitivity resists for nanolithog.)

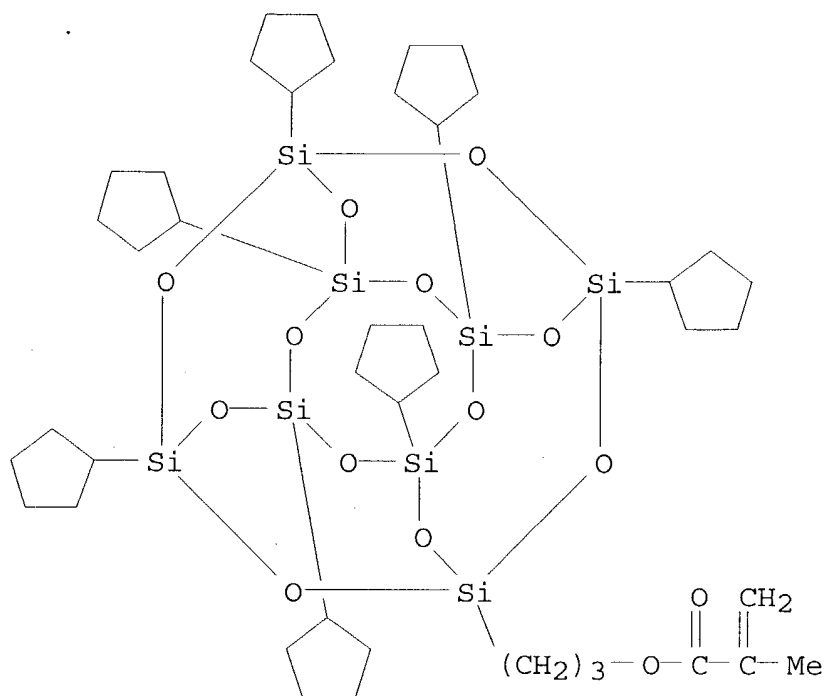
RN 302347-58-6 HCA

CN 2-Propenoic acid, 2-methyl-, 3-(heptacyclopentylpentacyclo[9.5.1.13, 9.15,15.17,13]octasiloxanyl)propyl ester, polymer with methyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 169391-91-7

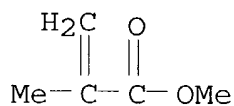
CMF C42 H74 O14 Si8



CM 2

CRN 80-62-6

CMF C5 H8 O2



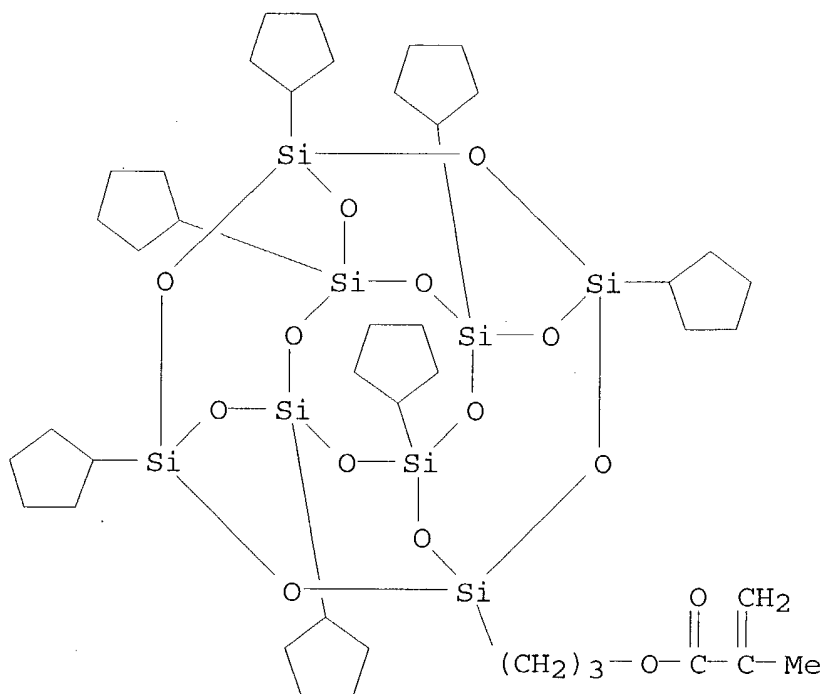
RN 302347-59-7 HCA

CN 2-Propenoic acid, 2-methyl-, 1,1-dimethylethyl ester, polymer with
 3-(heptacyclopentylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)p
 ropyl 2-methyl-2-propenoate and methyl 2-methyl-2-propenoate (9CI)
 (CA INDEX NAME)

CM 1

CRN 169391-91-7

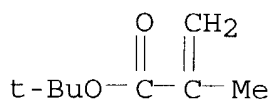
CMF C42 H74 O14 Si8



CM 2

CRN 585-07-9

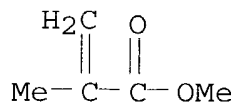
CMF C8 H14 O2



CM 3

CRN 80-62-6

CMF C5 H8 O2



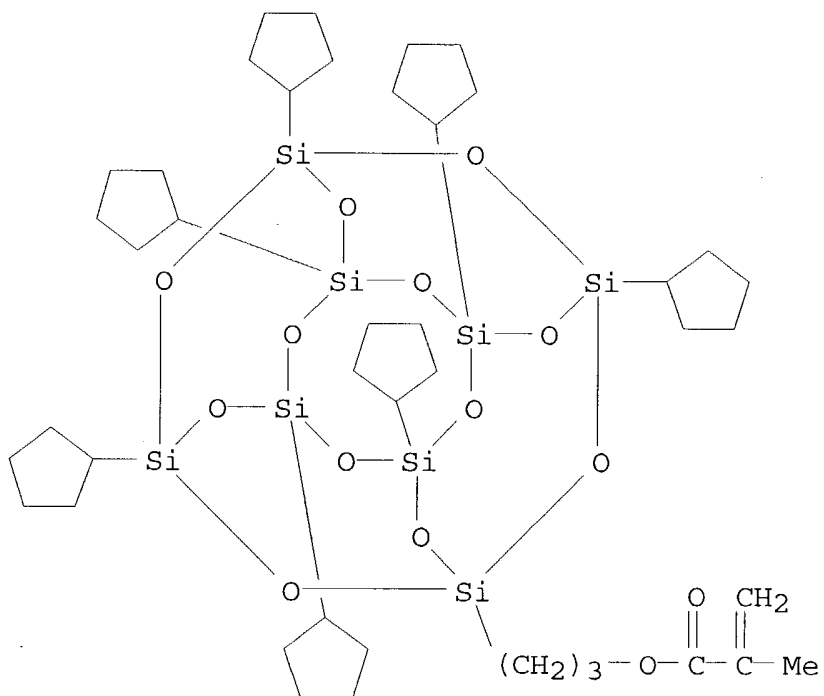
RN 302347-60-0 HCA

CN 2-Propenoic acid, 2-methyl-, 1,1-dimethylethyl ester, polymer with
 3-(heptacyclopentylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)p
 ropyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 169391-91-7

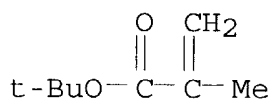
CMF C42 H74 O14 Si8



CM 2

CRN 585-07-9

CMF C8 H14 O2



IT 302347-58-6 302347-59-7 302347-60-0

(polymer-inorg. high contrast and high sensitivity resists for nanolithog.)

L44 ANSWER 20 OF 25 HCA COPYRIGHT 2003 ACS on STN

133:79275 Evaluation of multi-methacrylates copolymerized with methacryl-POSS for potential organic-inorganic hybrid dental restorative materials. Gao, Feng; Culbertson, Bill. M.; Tong, Yuhua; Schricker, Scott R. (Dentistry College, The Ohio State University, Columbus, OH, 43210-1241, USA). Polymer Preprints (American Chemical Society, Division of Polymer Chemistry), 41(1), 580-581 (English) 2000. CODEN: ACPPAY. ISSN: 0032-3934.

Publisher: American Chemical Society, Division of Polymer Chemistry.
 AB The shrinkage of methacrylate-based dental resins prep'd. can be reduced efficiently by incorporating 5 wt.% of methacrylate-functionalized Polyhedral Oligomeric Silsesquioxane (POSS) macromonomer into a mixt. of oligomeric dimethacrylate/diluent mixt. The mech. properties of the unfilled resins can also be improved.

IT **279687-80-8P 279687-83-1P 279687-85-3P**
 (evaluation of multi-methacrylates copolymd. with methacryl-polyhedral oligomeric silsesquioxane for potential org.-inorg. hybrid dental restorative materials)

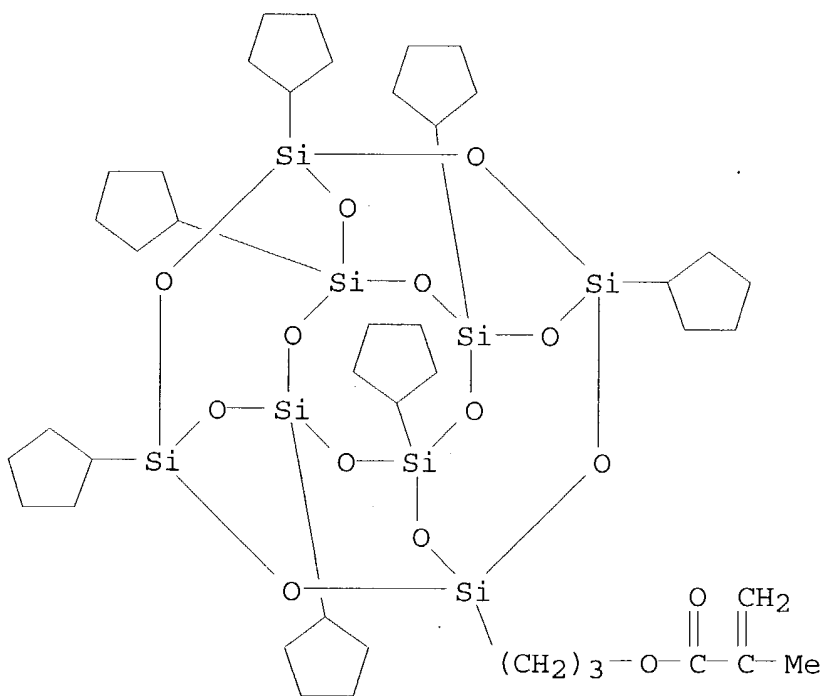
RN 279687-80-8 HCA

CN 2-Propenoic acid, 2-methyl-, 1,6-hexanediyl ester, polymer with 3-(heptacyclopentylpentacyclo[9.5.1.13,?.15,15.17,13]octasiloxanyl)propyl 2-methyl-2-propenoate and (1-methylethylidene)bis[4,1-phenyleneoxy(2-hydroxy-3,1-propanediyl)] bis(2-methyl-2-propenoate) (9CI) (CA INDEX NAME)

CM 1

CRN 169391-91-7

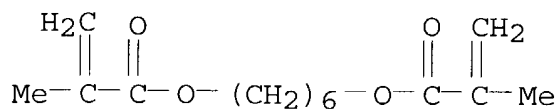
CMF C42 H74 O14 Si8



CM 2

CRN 6606-59-3

CMF C14 H22 O4

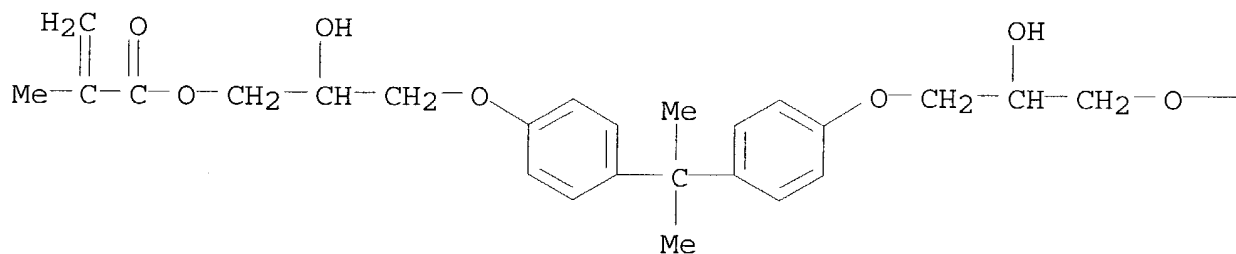


CM 3

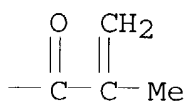
CRN 1565-94-2

CMF C29 H36 O8

PAGE 1-A



PAGE 1-B



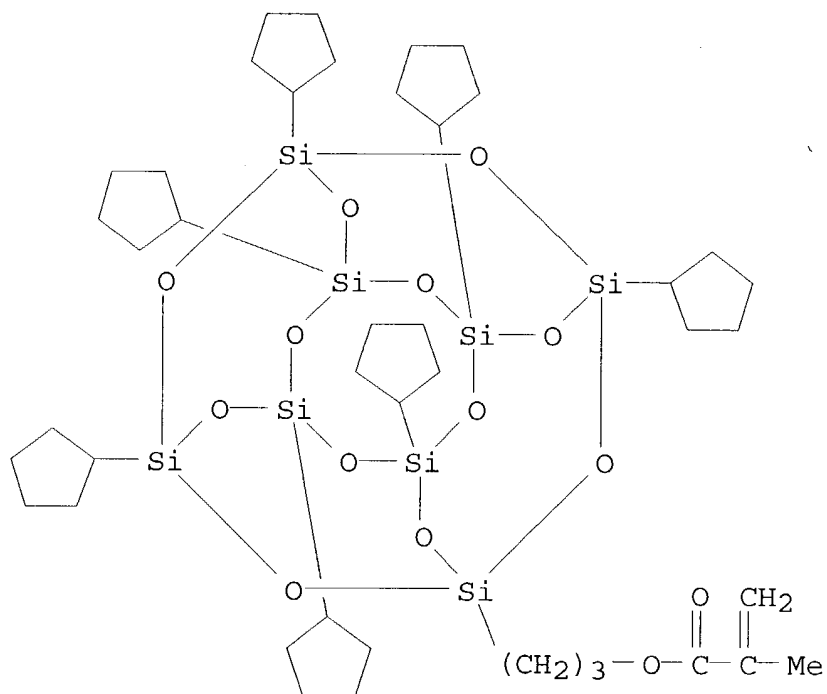
RN 279687-83-1 HCA

CN 2-Propenoic acid, 2-methyl-, (1-methylethylidene)bis[4,1-phenyleneoxy(2-hydroxy-3,1-propanediyl)] ester, polymer with 1,1-dimethylethyl 2-methyl-2-propenoate and 3-(heptacyclopentylpentacyclo[9.5.1.13,?.15,15.17,13]octasiloxanyl)propyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 169391-91-7

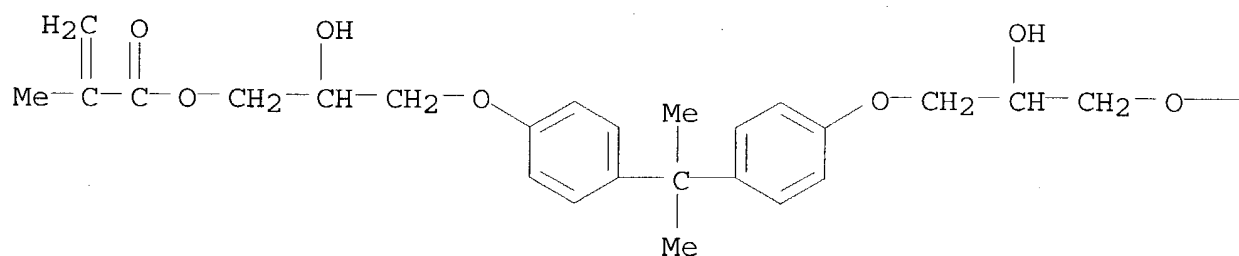
CMF C42 H74 O14 Si8



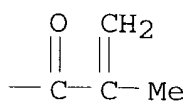
CM 2

CRN 1565-94-2
CMF C29 H36 O8

PAGE 1-A

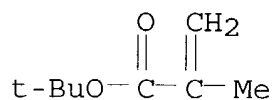


PAGE 1-B



CM 3

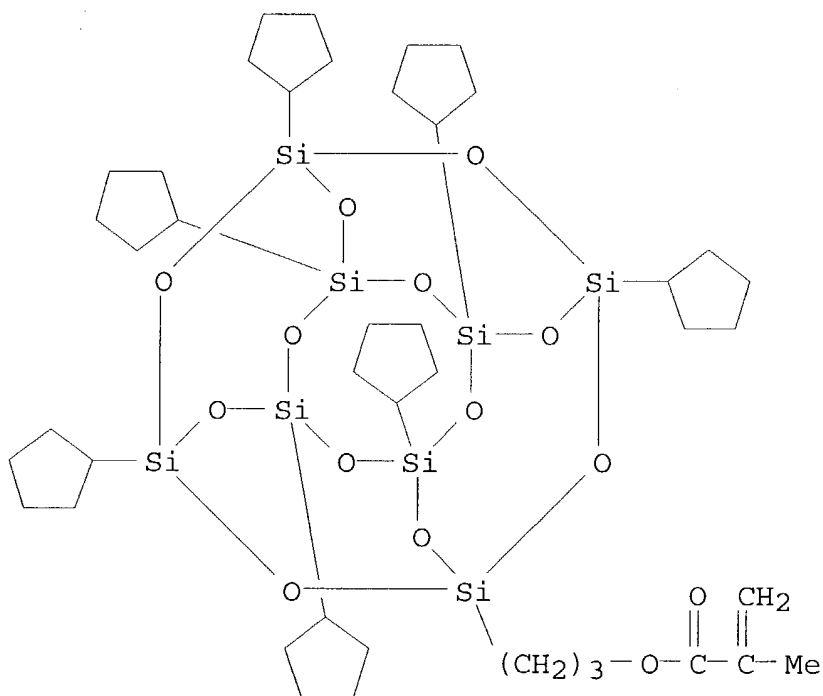
CRN 585-07-9
CMF C8 H14 O2



RN 279687-85-3 HCA
CN 2-Propenoic acid, 2-methyl-, (1-methylethylidene)bis[4,1-phenyleneoxy(2-hydroxy-3,1-propanediyl)] ester, polymer with 2-ethylhexyl 2-methyl-2-propenoate and 3-(heptacyclopentylpentacyclo[9.5.1.13,?.15,15.17,13]octasiloxanyl)propyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

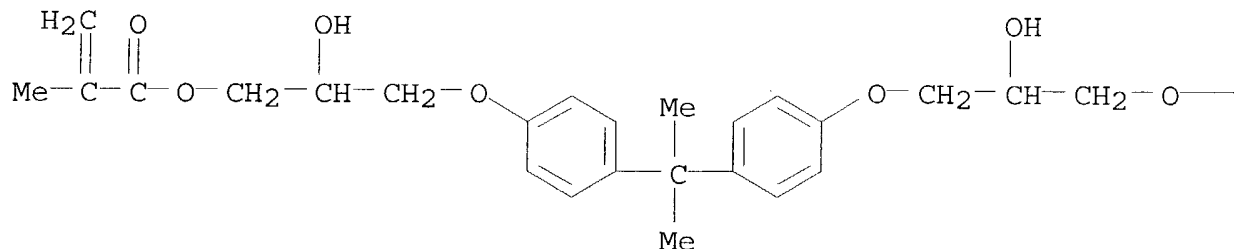
CRN 169391-91-7
CMF C42 H74 O14 Si8



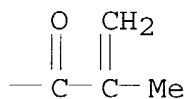
CM 2

CRN 1565-94-2
CMF C29 H36 O8

PAGE 1-A



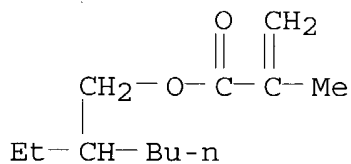
PAGE 1-B



CM 3

CRN 688-84-6

CMF C12 H22 O2



IT 279687-80-8P 279687-83-1P 279687-85-3P

(evaluation of multi-methacrylates copolymd. with methacryl-polyhedral oligomeric silsesquioxane for potential org.-inorg. hybrid dental restorative materials)

L44 ANSWER 21 OF 25 HCA COPYRIGHT 2003 ACS on STN

132:335664 Synthesis and microstructural characterization of POSS-based triblock copolymers prepared using atom transfer radical polymerization. Mather, Patrick T.; Chun, Seung B.; Pyun, Jeffrey; Matyjaszewski, Krzysztof; Jeon, Hong G. (Polymer Program, Institute of Materials Science, University of Connecticut, Storrs, CT, 06269-3136, USA). Polymer Preprints (American Chemical Society, Division of Polymer Chemistry), 41(1), 582-583 (English) 2000. CODEN: ACPPAY. ISSN: 0032-3934. Publisher: American Chemical Society, Division of Polymer Chemistry.

AB POSS-based hybrid polymers have provided an approach toward enhancing the properties of existing polymer systems with little

modification to polymn. methods. The present challenge is to extend this paradigm to more complex macromol. architectures and compns., namely block copolymers. Block copolymers incorporating polyhedral oligomeric silsesquioxane (POSS) monomers using atom transfer radical polymn. (ATRP) are made and characterized. Triblock copolymers have been synthesized starting from polyacrylate macroinitiators (p(Bu acrylate)) and chain extending with methacrylate POSS monomers. Mol. characterization of these materials was conducted by SEC and ^1H NMR, while microstructural characterization was performed using transmission electron microscopy (TEM), small angle x-ray scattering (SAXS), and wide-angle x-ray scattering (WAXS). The ordered microstructures evolve in terms of the interactions between the POSS outer blocks and the acrylate inner block.

IT 255872-36-7P

(rubber; acrylic-silsesquioxane triblock copolymers prepd. using atom transfer radical polymn.)

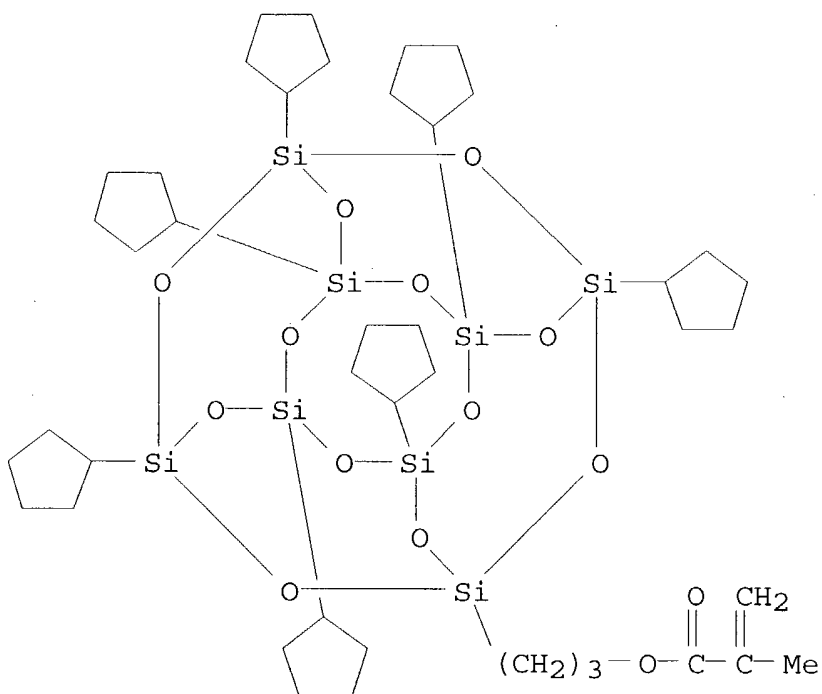
RN 255872-36-7 HCA

CN 2-Propenoic acid, 2-methyl-, 3-(heptacyclopentylpentacyclo[9.5.1.13, 9.15,15.17,13]octasiloxanyl)propyl ester, polymer with butyl 2-propenoate, block (9CI) (CA INDEX NAME)

CM 1

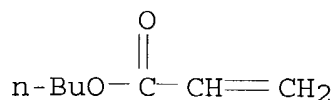
CRN 169391-91-7

CMF C42 H74 O14 Si8



CM 2

CRN 141-32-2
CMF C7 H12 O2



IT 255872-36-7P

(rubber; acrylic-silsesquioxane triblock copolymers prepd. using atom transfer radical polymn.)

L44 ANSWER 22 OF 25 HCA COPYRIGHT 2003 ACS on STN

132:166622 Synthesis of organic/inorganic hybrid materials from polysiloxane precursors using atom transfer radical polymerization. Pyun, Jeffrey; Miller, Peter J.; Kickelbick, Guido; Matyjaszewski, Krzysztof; Schwab, Joseph; Lichtenhan, Joseph (Center for Macromolecular Engineering, Dept. of Chemistry, Carnegie Mellon University, Pittsburgh, PA, 15213, USA). Polymer Preprints (American Chemical Society, Division of Polymer Chemistry), 40(2), 454-455 (English) 1999. CODEN: ACPPAY. ISSN: 0032-3934. Publisher: American Chemical Society, Division of Polymer Chemistry.

AB The synthesis of org./inorg. hybrid materials from polyhedral oligomeric silsesquioxanes (POSS) using atom transfer radical polymn. (ATRP) was carried out. From POSS monomers contg. either methacryloyl, or styryl groups, well-defined polymers of various compns. and topologies were prepd. The compn. of these materials was controlled and well-defined homopolymers, random and block copolymers of POSS-contg. monomers were synthesized. The use of macroinitiators of various topologies allowed for the synthesis of ABA-triblock and star-block copolymers, using ATRP.

IT 255872-36-7P

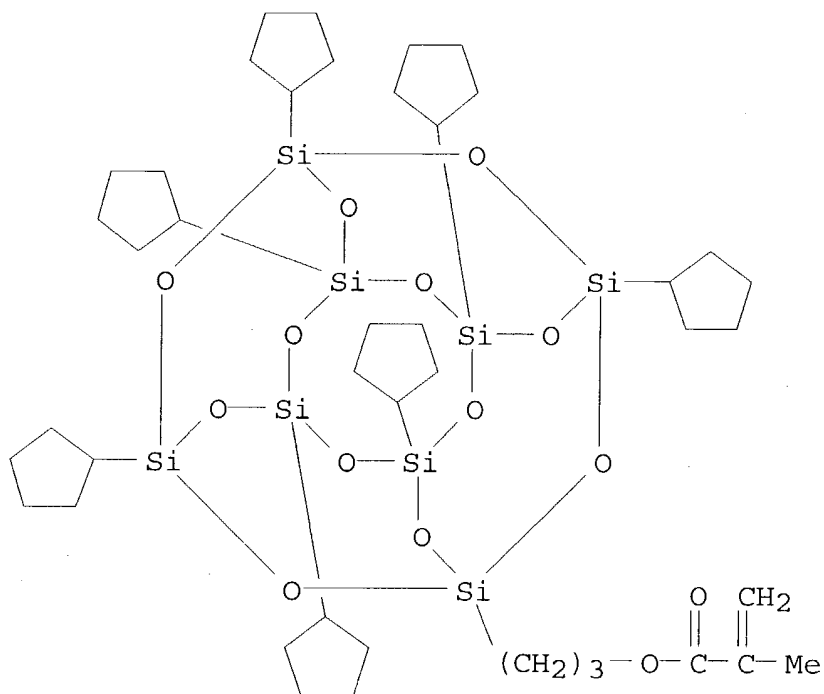
(block; prepn. of methacryloyl- and styryl-silsesquioxane homopolymers and block copolymers and star copolymers by ATRP as precursors for org./inorg. hybrid materials)

RN 255872-36-7 HCA

CN 2-Propenoic acid, 2-methyl-, 3-(heptacyclopentylpentacyclo[9.5.1.13, 9.15,15.17,13]octasiloxanyl)propyl ester, polymer with butyl 2-propenoate, block (9CI) (CA INDEX NAME)

CM 1

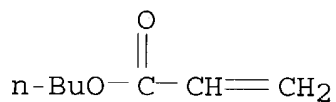
CRN 169391-91-7
CMF C42 H74 O14 Si8



CM 2

CRN 141-32-2

CMF C7 H12 O2



IT 169699-57-4P

(prepn. of methacryloyl- and styryl-silsesquioxane homopolymers
and block copolymers and star copolymers by ATRP as precursors
for org./inorg. hybrid materials)

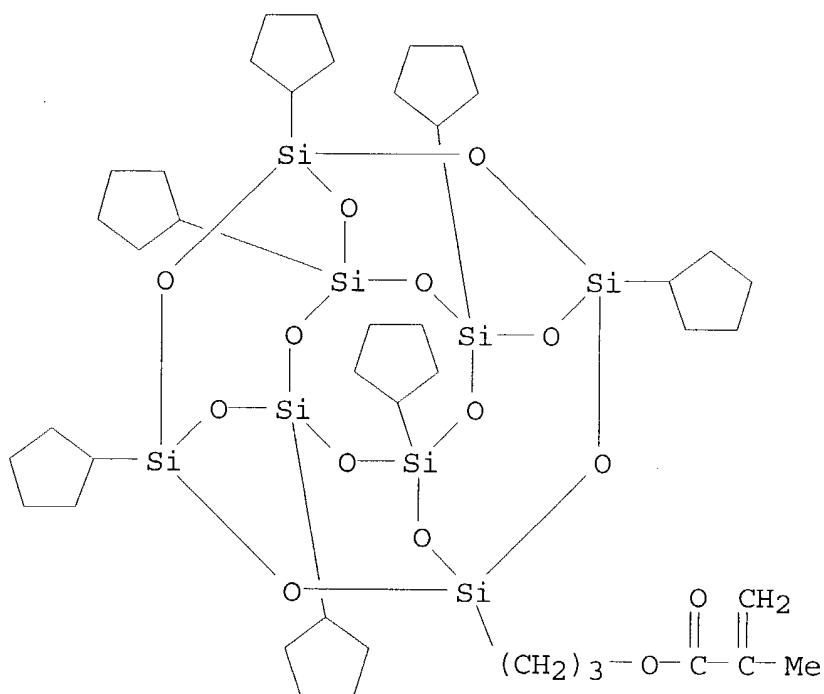
RN 169699-57-4 HCA

CN 2-Propenoic acid, 2-methyl-, 3-(heptacyclopentylpentacyclo[9.5.1.13,
9.15,15.17,13]octasiloxanyl)propyl ester, homopolymer (9CI) (CA
INDEX NAME)

CM 1

CRN 169391-91-7

CMF C42 H74 O14 Si8



IT 255872-37-8P

(star block; prepn. of methacryloyl- and styryl-silsesquioxane homopolymers and block copolymers and star copolymers by ATRP as precursors for org./inorg. hybrid materials)

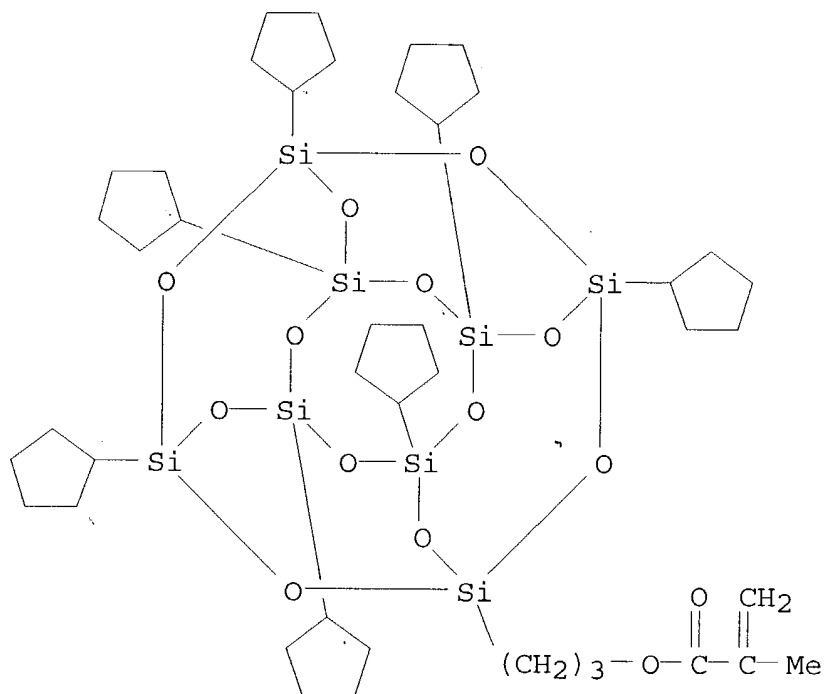
RN 255872-37-8 HCA

CN 2-Propenoic acid, 2-methyl-, 3-(heptacyclopentylpentacyclo[9.5.1.13, 9.15,15.17,13]octasiloxanyl)propyl ester, polymer with methyl 2-propenoate, block (9CI) (CA INDEX NAME)

CM 1

CRN 169391-91-7

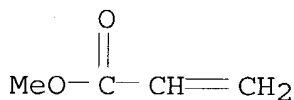
CMF C42 H74 O14 Si8



CM 2

CRN 96-33-3

CMF C4 H6 O2



IT 255872-36-7P

(block; prepn. of methacryloyl- and styryl-silsesquioxane homopolymers and block copolymers and star copolymers by ATRP as precursors for org./inorg. hybrid materials)

IT 169699-57-4P

(prepn. of methacryloyl- and styryl-silsesquioxane homopolymers and block copolymers and star copolymers by ATRP as precursors for org./inorg. hybrid materials)

IT 255872-37-8P

(star block; prepn. of methacryloyl- and styryl-silsesquioxane homopolymers and block copolymers and star copolymers by ATRP as precursors for org./inorg. hybrid materials)

L44 ANSWER 23 OF 25 HCA COPYRIGHT 2003 ACS on STN

132:108370 Synthesis of hybrid polymers Using atom transfer radical polymerization: Homopolymers and Block Copolymers from polyhedral

oligomeric silsesquioxane monomers. Pyun, Jeffrey; Matyjaszewski, Krzysztof (Center for Macromolecular Engineering Department of Chemistry, Carnegie Mellon University, Pittsburgh, PA, 15213, USA). *Macromolecules*, 33(1), 217-220 (English) 2000. CODEN: MAMOBX. ISSN: 0024-9297. Publisher: American Chemical Society.

AB Homopolymers, triblock copolymers (Bu acrylate comonomer), and star-block copolymers (Me acrylate comonomer) of 3-(3,5,7,9,11,13,15-heptacyclopentyl-pentacyclo[9.5.1.1.3,91.5,1517,13]octasiloxane-1-yl)propyl methacrylate (MA-POSS) have been prepd.

IT **169699-57-4P**
(prepn. and characterization of; synthesis of hybrid polymers using atom transfer radical polymn. of polyhedral oligomeric silsesquioxane monomers)

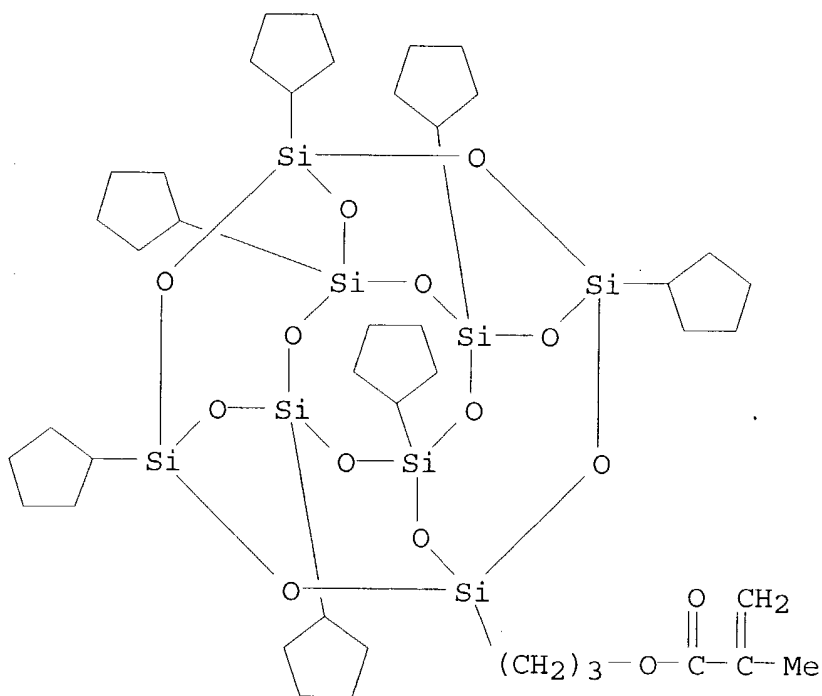
RN 169699-57-4 HCA

CN 2-Propenoic acid, 2-methyl-, 3-(heptacyclopentylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)propyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 169391-91-7

CMF C42 H74 O14 Si8



IT **255872-37-8P**

(star-block, 3-arm, prepn. and characterization of; synthesis of hybrid polymers using atom transfer radical polymn. of polyhedral oligomeric silsesquioxane monomers)

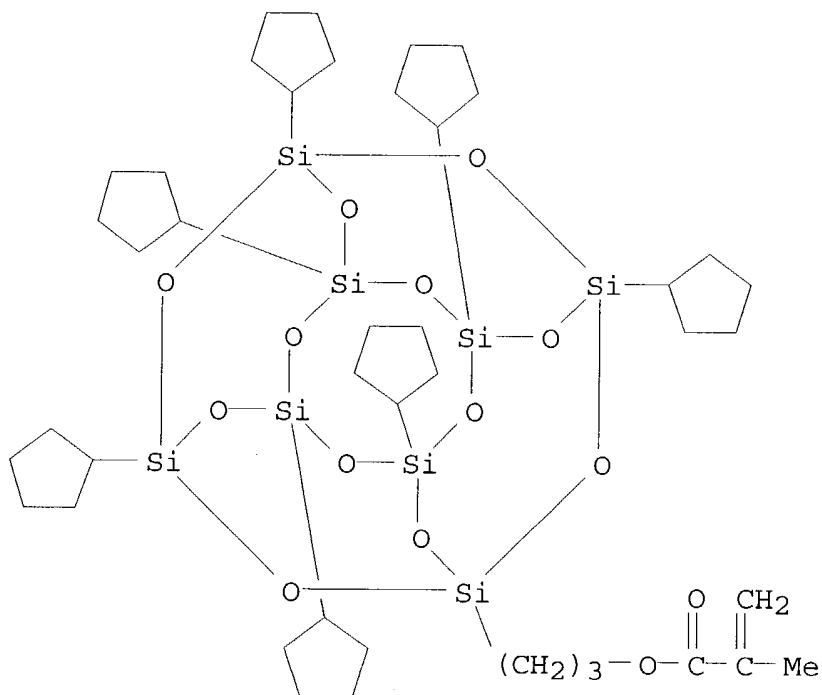
RN 255872-37-8 HCA

CN 2-Propenoic acid, 2-methyl-, 3-(heptacyclopentylpentacyclo[9.5.1.13, 9.15,15.17,13]octasiloxanyl)propyl ester, polymer with methyl 2-propenoate, block (9CI) (CA INDEX NAME)

CM 1

CRN 169391-91-7

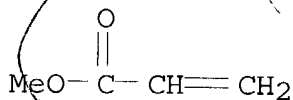
CMF C42 H74 O14 Si8



CM 2

CRN 96-33-3

CMF C4 H6 O2



IT 255872-36-7P

(triblock, prepn. and characterization of; synthesis of hybrid polymers using atom transfer radical polymn. of polyhedral oligomeric silsesquioxane monomers)

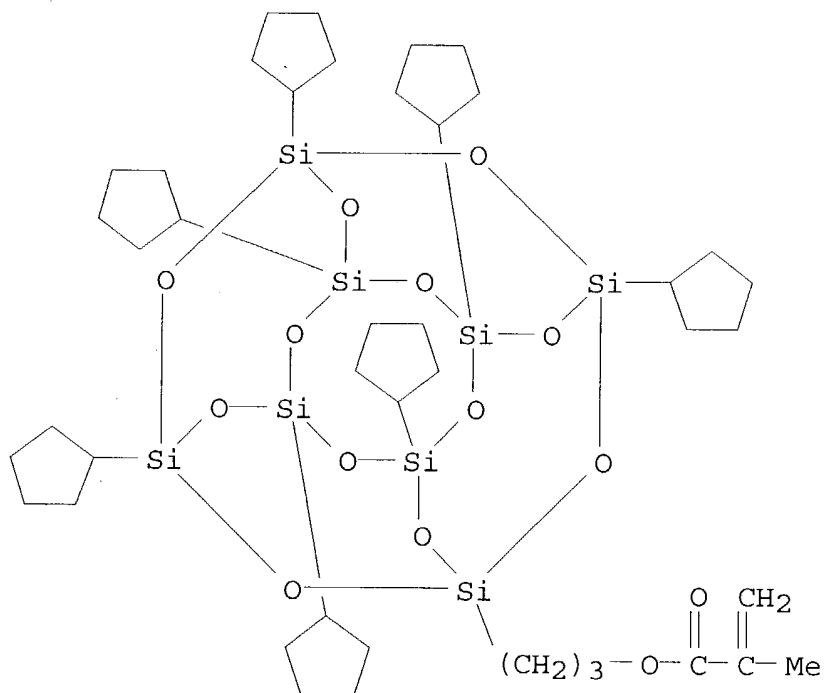
RN 255872-36-7 HCA

CN 2-Propenoic acid, 2-methyl-, 3-(heptacyclopentylpentacyclo[9.5.1.13, 9.15,15.17,13]octasiloxanyl)propyl ester, polymer with butyl 2-propenoate, block (9CI) (CA INDEX NAME)

CM 1

CRN 169391-91-7

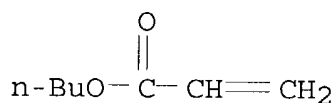
CMF C42 H74 O14 Si8



CM 2

CRN 141-32-2

CMF C7 H12 O2



IT 169699-57-4P

(prepn. and characterization of; synthesis of hybrid polymers using atom transfer radical polymn. of polyhedral oligomeric silsesquioxane monomers)

IT 255872-37-8P

(star-block, 3-arm, prepn. and characterization of; synthesis of hybrid polymers using atom transfer radical polymn. of polyhedral oligomeric silsesquioxane monomers)

IT 255872-36-7P

(triblock, prepn. and characterization of; synthesis of hybrid polymers using atom transfer radical polymn. of polyhedral

oligomeric silsesquioxane monomers)

L44 ANSWER 24 OF 25 HCA COPYRIGHT 2003 ACS on STN

123:286932 Linear Hybrid Polymer Building Blocks: Methacrylate-Functionalized Polyhedral Oligomeric Silsesquioxane Monomers and Polymers. Lichtenhan, Joseph D.; Otonari, Yoshiko A.; Carr, Michael J. (Propulsion Directorate, Phillips Laboratory, Edwards Air Force Base, CA, 93524, USA). Macromolecules, 28(24), 8435-7 (English) 1995. CODEN: MAMOBX. ISSN: 0024-9297. Publisher: American Chemical Society.

AB A new class of methacrylic monomers and their corresponding linear polymers have been developed. POSS monomers of the formula $R_7Si_8O_{12}(CH_2)_3OC(O)C(CH_3):CH_2$ were synthesized by corner capping the POSS trisilanol cages $R_7Si_7O_9(OH)_3$ (where $R = c-C_6H_{11}$, $c-C_5H_9$) with methacrylate contg. trichlorosilanes. The utility of these reagents for the prepn. of linear methacrylate-based polymers contg. the octameric silsesquioxane cage structure as a pendant group was demonstrated. Homo and copolymers of these systems are amorphous in nature and do not show any thermal transitions below their 388.degree. decompn. temps. The thermal behavior of these systems is attributed to the dominant presence of the pendant silsesquioxane cages.

IT 169699-58-5P

(copolymer; prepn. of methacrylate-functionalized polyhedral oligomeric silsesquioxane monomers and polymers)

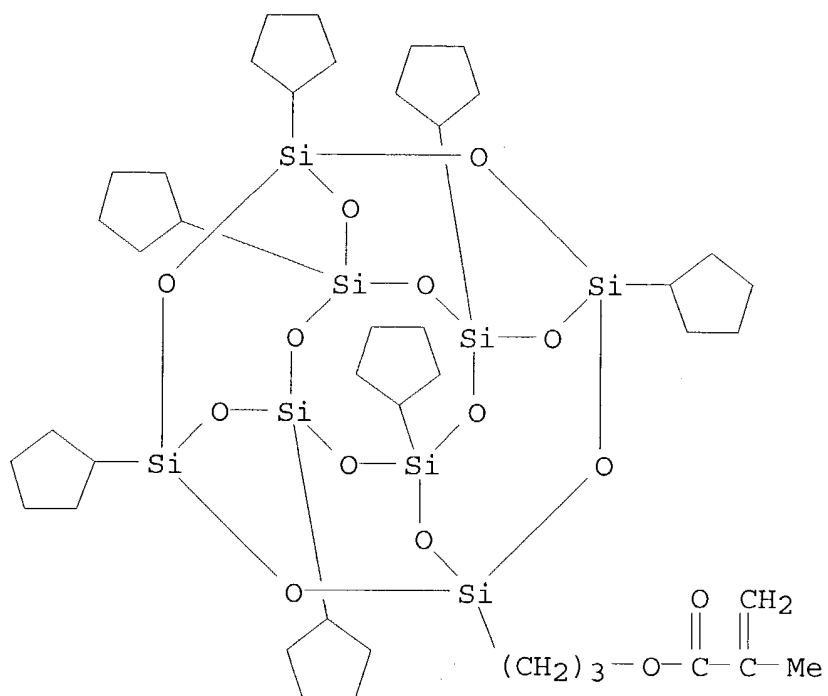
RN 169699-58-5 HCA

CN 2-Propenoic acid, 2-methyl-, 3-(heptacyclohexylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)propyl ester, polymer with 3-(heptacyclopentylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)propyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 169391-91-7

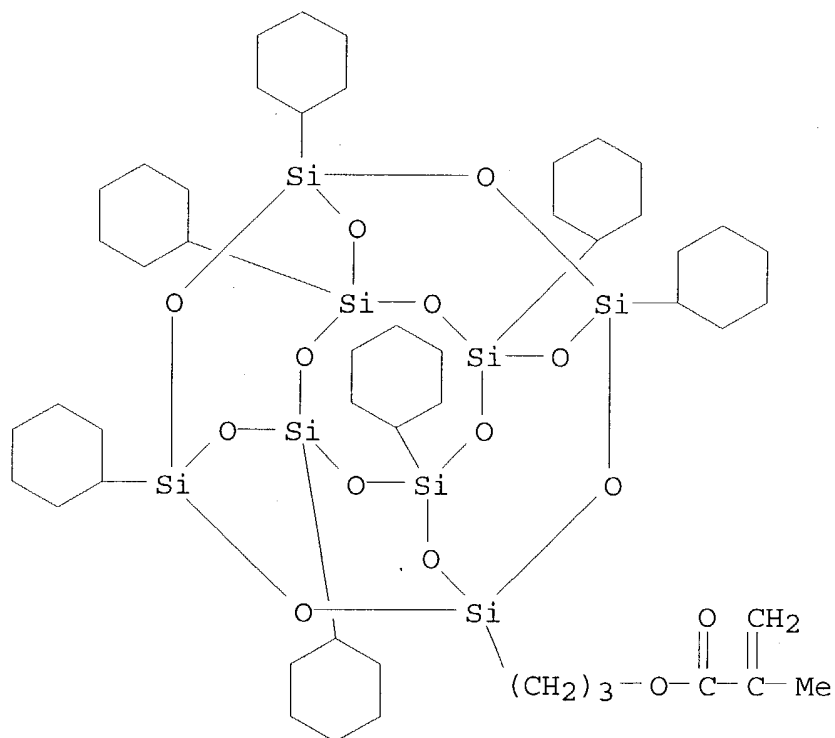
CMF C42 H74 O14 Si8



CM 2

CRN 169391-90-6

CMF C49 H88 O14 Si8



IT 169699-56-3P 169699-57-4P

(homopolymer; prepn. of methacrylate-functionalized polyhedral oligomeric silsesquioxane monomers and polymers)

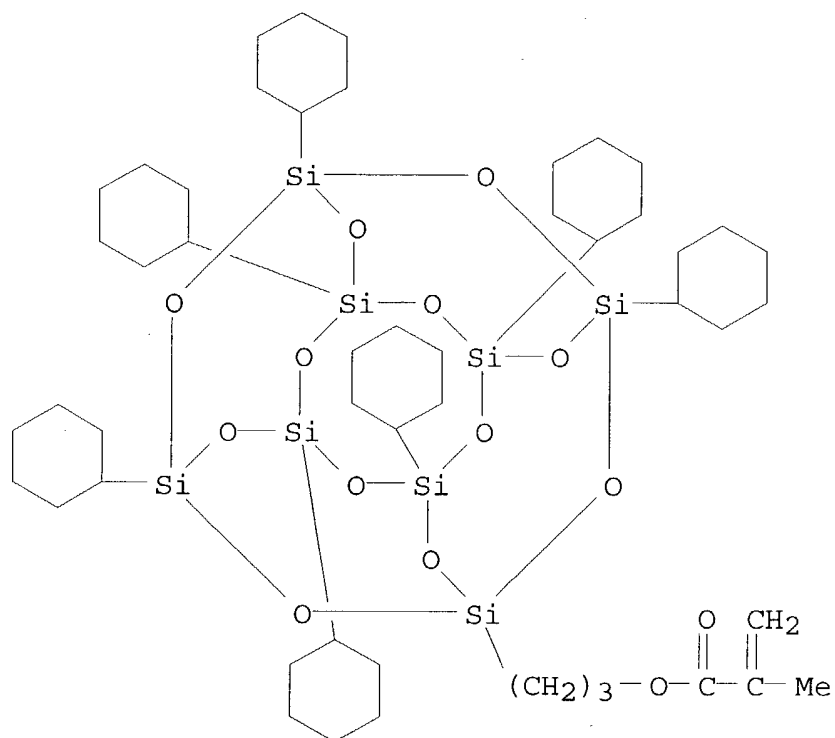
RN 169699-56-3 HCA

CN 2-Propenoic acid, 2-methyl-, 3-(heptacyclohexylpentacyclo[9.5.1.13,9.15.15.17,13]octasiloxanyl)propyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 169391-90-6

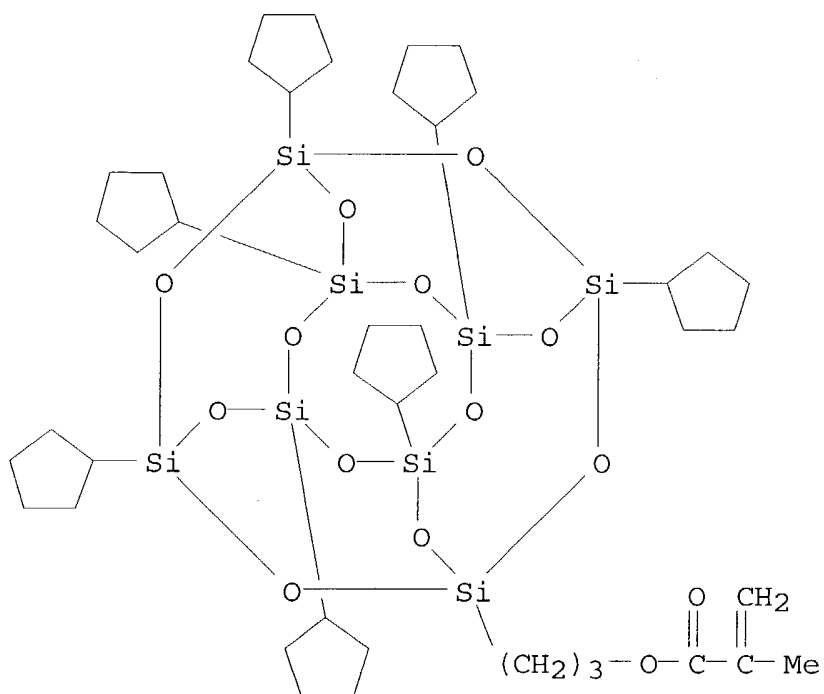
CMF C49 H88 O14 Si8



RN 169699-57-4 HCA
 CN 2-Propenoic acid, 2-methyl-, 3-(heptacyclopentylpentacyclo[9.5.1.13, 9.15, 15.17, 13]octasiloxanyl)propyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 169391-91-7
 CMF C42 H74 O14 Si8



IT 169699-58-5P

(copolymer; prepn. of methacrylate-functionalized polyhedral oligomeric silsesquioxane monomers and polymers)

IT 169699-56-3P 169699-57-4P

(homopolymer; prepn. of methacrylate-functionalized polyhedral oligomeric silsesquioxane monomers and polymers)

L44 ANSWER 25 OF 25 HCA COPYRIGHT 2003 ACS on STN

123:286789 Coupling of allyloxy and propargyloxy moieties with hydridosilanes: novel liquid crystalline functionalized silsesquioxanes. Sellinger, Alan; Laine, Richard M. (Department Materials Science Engineering, University Michigan, Ann Arbor, MI, 48109-2136, USA). Polymer Preprints (American Chemical Society, Division of Polymer Chemistry), 35(2), 665-6 (English) 1994. CODEN: ACPPAY. ISSN: 0032-3934. Publisher: American Chemical Society, Division of Polymer Chemistry.

AB The synthesis and characterization of novel liq. cryst. and methacrylate-functionalized silsesquioxanes $(\text{HSiO}_{1.5})_8$ prep'd. by Pt-catalyzed coupling of 4 equiv. of 4-(4-allyloxybenzoyloxy)biphenyl or propargyl methacrylate with 1 equiv. octahydridosilsesquioxane. The low polymn. temp. for the methacrylate-functionalized silsesquioxane shows very promising utility for use in dental materials and abrasion-resistant coatings.

IT 169893-90-7P

(prepn. and polymn. of liq. cryst. functionalized silsesquioxanes)

RN 169893-90-7 HCA

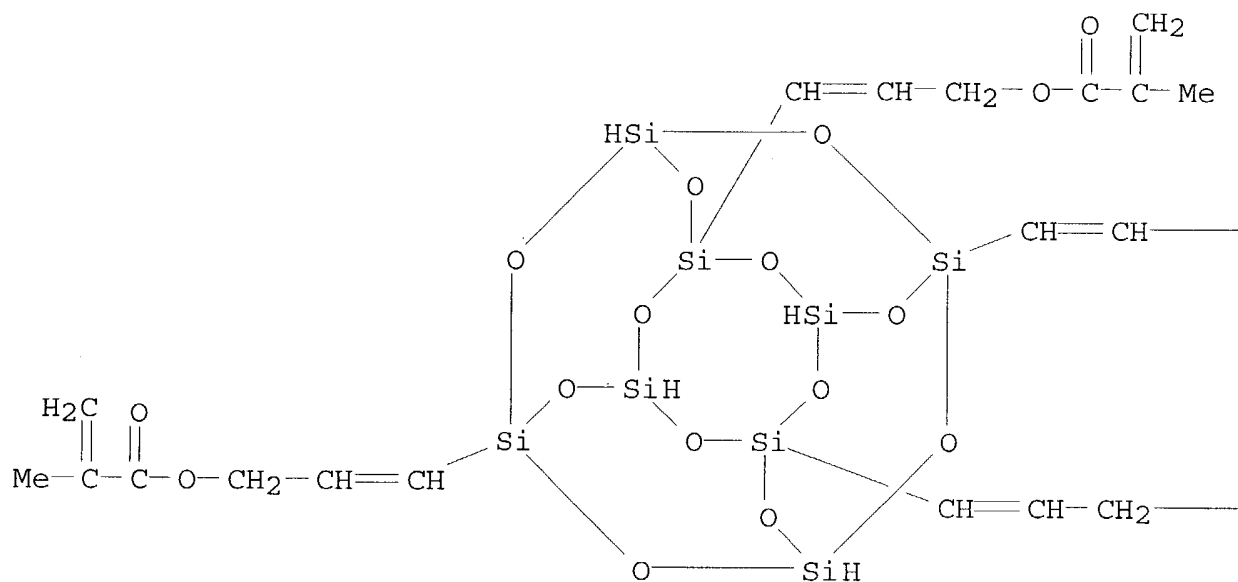
CN 2-Propenoic acid, 2-methyl-, pentacyclo[9.5.1.13,9.15,15.17,13]octas
iloxane-1,5,9,13-tetra-2-propene-3,1-diyl ester, homopolymer
(9CI) (CA INDEX NAME)

CM 1

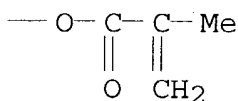
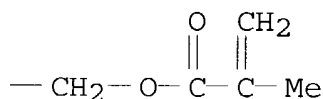
CRN 169893-88-3

CMF C28 H40 O20 Si8

PAGE 1-A



PAGE 1-B



IT 169893-90-7P

(prepn. and polymn. of liq. cryst. functionalized silsesquioxanes)

=> d l45 1-13 cbib abs hitstr hitind

L45 ANSWER 1 OF 13 HCA COPYRIGHT 2003 ACS on STN

138:74288 Polymer electrolytes and polyethylene glycol-containing crosslinked polysiloxanes therefor. Iwatani, Keizo; Yoza, Akira; Oikawa, Takao; Yamamoto, Yasuhiro (Chisso Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2003002974 A2 20030108 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-188321/20010621.

AB The electrolytes, showing good flexibility and high ion cond., comprise Li salts and crosslinked polysiloxanes having trifunctional Si and polyoxyethylene repeating units,. The polysiloxanes may be represented by $[X(OX_2H_4)q_1OY_1]_nZ_m[(R_2SiO)rSiO_3/2]_p$ [X = C1-6 alkyl; Y1 = C2-20 alkylene; Z = group both-ends-terminated with C2-20 alkylene; R = X1-6 alkyl; q1, n, m .gtoreq.1; r = 0, 1; p = 4-60; n + 2m = p]. Thus, triethylene glycol allyl Me ether 0.803, polyethylene glycol diallyl ether 0.748, and 1,3,5,7,9,11,13,15-octakis(dimethylsiloxy)pentacyclo[9.5.1.13,9.15,15.1.7,13]octasiloxane 1.00 g were reacted at 80-120.degree. in the presence of Pt-divinyldisiloxane complex to give a crosslinked product, 0.1 g of which was reacted with 5.98 .times. 10⁻³ g LiClO₄ in THF to give a solid electrolyte showing ion cond. 1.8 .times. 10⁻⁵ S/cm and flexural modulus 0.53 MPa at room. temp.

IT 481052-04-4DP, reaction products with triethylene glycol allyl Me ether, lithium complexes, hydrochlorate-contg.

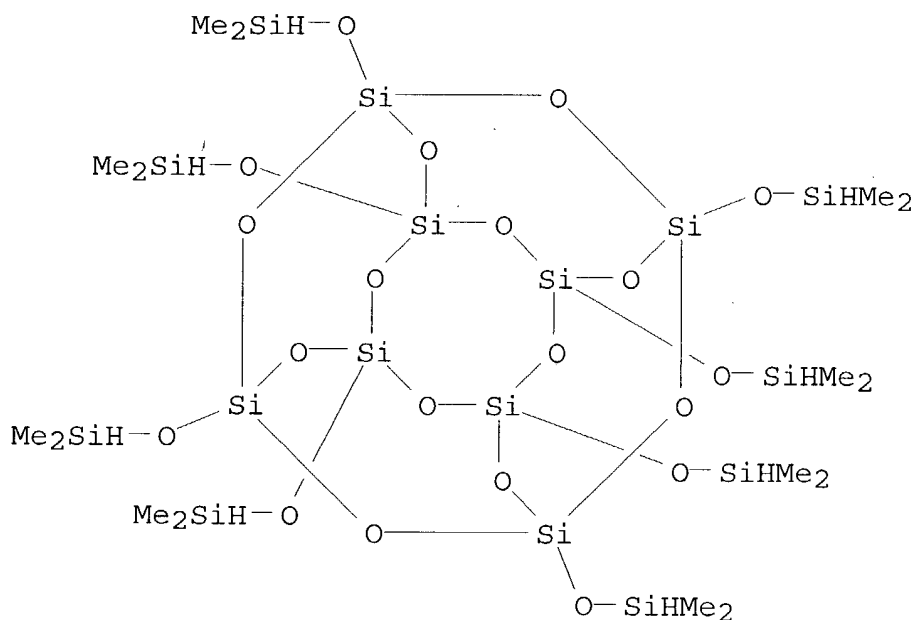
(high-ion-cond. and flexible solid electrolytes of polyethylene glycol-contg. POSS-Li complexes)

RN 481052-04-4 HCA
 CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane,
 octakis[(dimethylsilyl)oxy]-, polymer with .alpha.-2-propenyl-
 .omega.-(2-propenyloxy)poly(oxy-1,2-ethanediyl) (9CI) (CA INDEX
 NAME)

CM 1

CRN 125756-69-6

CMF C16 H56 O20 Si16

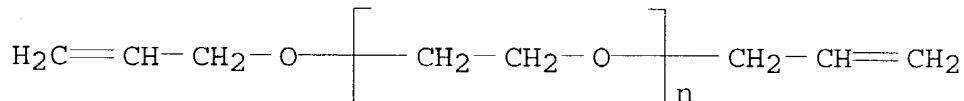


CM 2

CRN 59788-01-1

CMF (C2 H4 O)_n C6 H10 O

CCI PMS



IC ICM C08G077-46

ICS H01B001-06; H01G009-028; H01M006-18; H01M010-40

CC 38-3 (Plastics Fabrication and Uses)

Section cross-reference(s): 52, 76

ST flexible electrolyte polyethylene glycol oligosilsesquioxane

crosslinked; **polyhedral oligosilsesquioxane**
polyethylene glycol battery electrolyte;
octakisdimethylsiloxypentacyclooctasiloxane polyethylene glycol
lithium complex electrolyte
IT 7439-93-2DP, Lithium, poly(ethylene oxide)-
oligosilsesquioxane complexes, hydrochlorate-contg.
19685-21-3DP, Triethylene glycol allyl methyl ether, reaction
products with **polyhedral oligosilsesquioxanes**,
Li complexes, hydrochlorate-contg. 481052-04-4DP, reaction
products with triethylene glycol allyl Me ether, lithium complexes,
hydrochlorate-contg.
(high-ion-cond. and flexible solid electrolytes of polyethylene
glycol-contg. POSS-Li complexes)

L45 ANSWER 2 OF 13 HCA COPYRIGHT 2003 ACS on STN

138:57248 Synthesis and Characterization of an Isocyanate Functionalized
Polyhedral Oligosilsesquioxane and the Subsequent
Formation of an Organic-Inorganic Hybrid Polyurethane. Neumann,
Daniel; Fisher, Mark; Tran, Linh; Matisons, Janis G. (Ian Wark
Research Institute, University of South Australia, Mawson Lakes,
5095, Australia). Journal of the American Chemical Society,
124(47), 13998-13999 (English) 2002. CODEN: JACSAT. ISSN:
0002-7863. Publisher: American Chemical Society.

AB Here we report the synthesis and characterization of a novel
polyhedral oligosilsesquioxanes (POSS) possessing
eight isocyanate groups via the hydrosilylation of
octakis(hydridodimethylsiloxo)octasilsesquioxane (Q8M8H) and
m-isopropenyl-.alpha.,.alpha.'-dimethylbenzyl isocyanate (m-TMI).
The suitability of this new macromer to the synthesis of a
org.-hybrids was explored by forming a new type of highly
crosslinked polyurethane elastomer via reaction of the macromer with
poly(ethylene glycol) using dibutyltin dilaurate catalyst.

IT 479217-72-6P
(prepn. and characterization of)

RN 479217-72-6 HCA

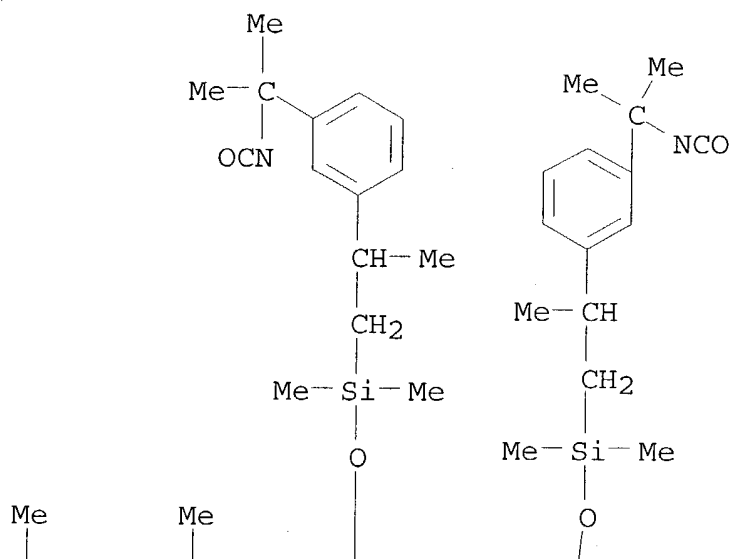
CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octakis[[[2-[3-(1-
isocyanato-1-methylethyl)phenyl]propyl]dimethylsilyl]oxy]-, polymer
with .alpha.-hydro-.omega.-hydroxypoly(oxy-1,2-ethanediyl) (9CI)
(CA INDEX NAME)

CM 1

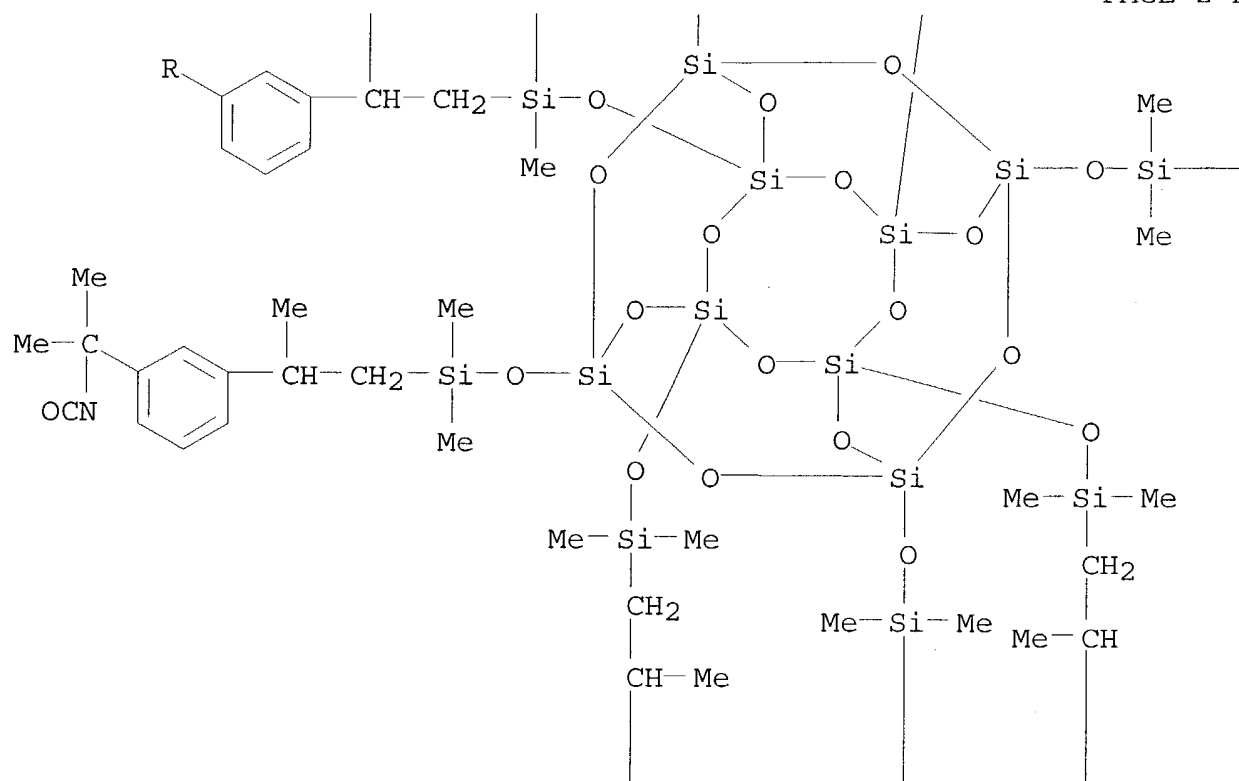
CRN 479217-70-4

CMF C120 H176 N8 O28 Si16

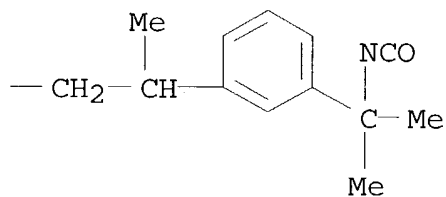
PAGE 1-A

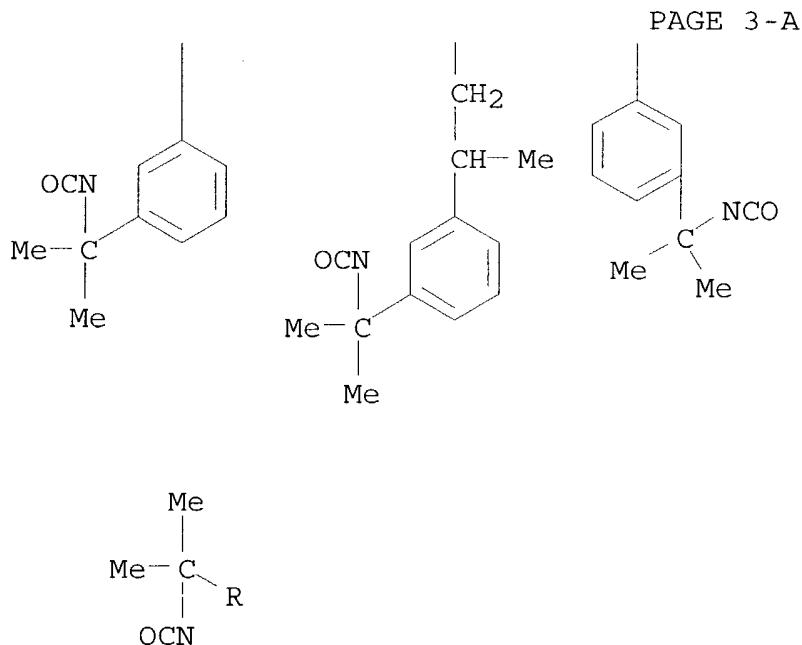


PAGE 2-A



PAGE 2-B



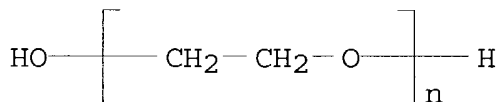


CM 2

CRN 25322-68-3

CMF (C₂ H₄ O)_n H₂ O

CCI PMS



CC 39-4 (Synthetic Elastomers and Natural Rubber)

Section cross-reference(s): 35

ST isocyanate functionalized **polyhedral oligosilsesquioxane** prepn characterization; polyurethane rubber **polyhedral oligosilsesquioxane**; dibutyltin dilaurate catalyst polymn isocyanate **polyhedral oligosilsesquioxane**

IT Polymerization catalysts
(dibutyltin dilaurate; polymn. of isocyanate functionalized **polyhedral oligosilsesquioxane** with polyethylene glycol in presence of)

IT Melting point
(of isocyanate functionalized **polyhedral oligosilsesquioxane**)

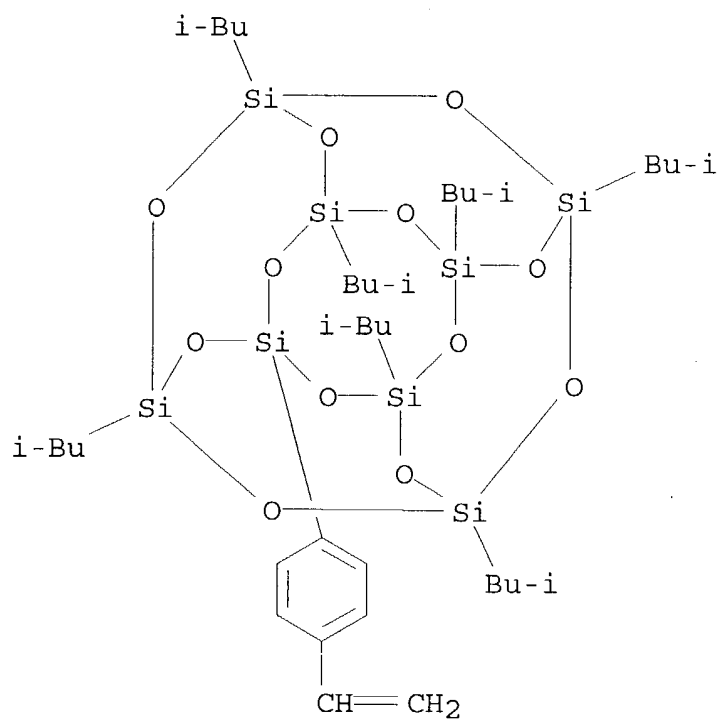
IT Glass transition temperature
(of isocyanate functionalized **polyhedral**

- oligosilsesquioxane** and polyurethane rubber)
IT Urethane rubber, preparation
(polyoxyalkylene-; prepn. of polyurethane rubber from isocyanate functionalized **polyhedral oligosilsesquioxane**)
IT Hybrid organic-inorganic materials
Nanocomposites
(prepn. of polyurethane rubber from isocyanate functionalized **polyhedral oligosilsesquioxane**)
IT 77-58-7, Dibutyltin dilaurate
(polymn. of isocyanate functionalized **polyhedral oligosilsesquioxane** with polyethylene glycol in presence of)
IT **479217-72-6P**
(prepn. and characterization of)
- L45 ANSWER 3 OF 13 HCA COPYRIGHT 2003 ACS on STN
138:14196 Glass transition temperatures of poly(hydroxystyrene-co-vinylpyrrolidone-co-isobutylstyryl **polyhedral oligosilsesquioxanes**). Xu, Hongyao; Kuo, Shiao-Wei; Lee, Juh-Shyong; Chang, Feng-Chih (Institute of Applied Chemistry, National Chiao-Tung University, Hsin-Chu, 30043, Taiwan). Polymer, 43(19), 5117-5124 (English) 2002. CODEN: POLMAG. ISSN: 0032-3861. Publisher: Elsevier Science Ltd..
- AB A series of poly(hydroxystyrene-co-vinylpyrrolidone-co-isobutylstyryl **polyhedral oligosilsesquioxanes**) (PHS-PVP-POSS) hybrid polymers with various POSS contents was prepd. by free radical copolymn. of acetoxystyrene, vinylpyrrolidone with styrylisobutyl **polyhedral oligosilsesquioxanes** (POSS), followed by selective removal of the acetyl protective group. The POSS content of a hybrid polymer can be effectively controlled by varying the feed ratios of reactants. The Tg of the POSS hybrid increases with the POSS content of PHS-PVP-POSS hybrids. The mechanism of Tg enhancement in these PHS-PVP-POSS hybrids was investigated using DSC, FTIR and GPC. The formation of the phys. cross-linked POSS in these hybrid polymers trends to restrict polymer chain motion and results in significant Tg increase.
- IT **477782-46-0DP**, deacetylated **477782-46-0P**
(prepn. and glass temp. of)
- RN 477782-46-0 HCA
CN 2-Pyrrolidinone, 1-ethenyl-, polymer with 4-ethenylphenyl acetate and (4-ethenylphenyl)heptakis(2-methylpropyl)pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane (9CI) (CA INDEX NAME)

CM 1

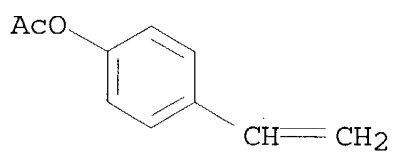
CRN 446276-27-3

CMF C36 H70 O12 Si8



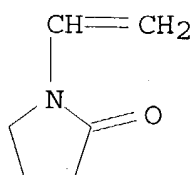
CM 2

CRN 2628-16-2
CMF C10 H10 O2



CM 3

CRN 88-12-0
CMF C6 H9 N O



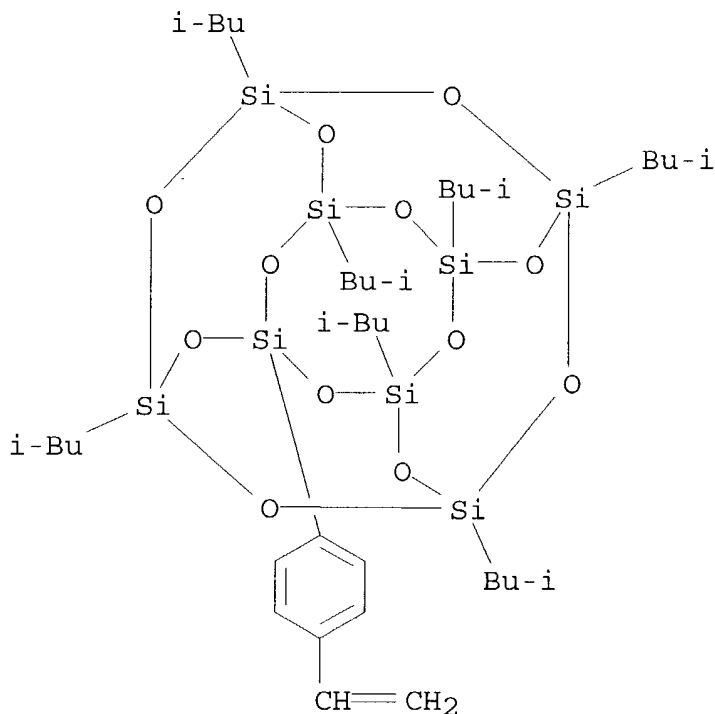
RN 477782-46-0 HCA

CN 2-Pyrrolidinone, 1-ethenyl-, polymer with 4-ethenylphenyl acetate and (4-ethenylphenyl)heptakis(2-methylpropyl)pentacyclo[9.5.1.13,9.15.15.17,13]octasiloxane (9CI) (CA INDEX NAME)

CM 1

CRN 446276-27-3

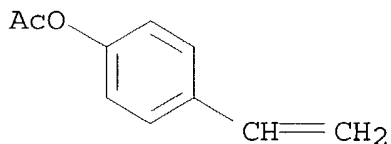
CMF C36 H70 O12 Si8



CM 2

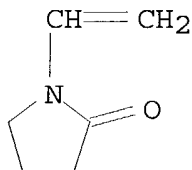
CRN 2628-16-2

CMF C10 H10 O2



CM 3

CRN 88-12-0
CMF C6 H9 N O



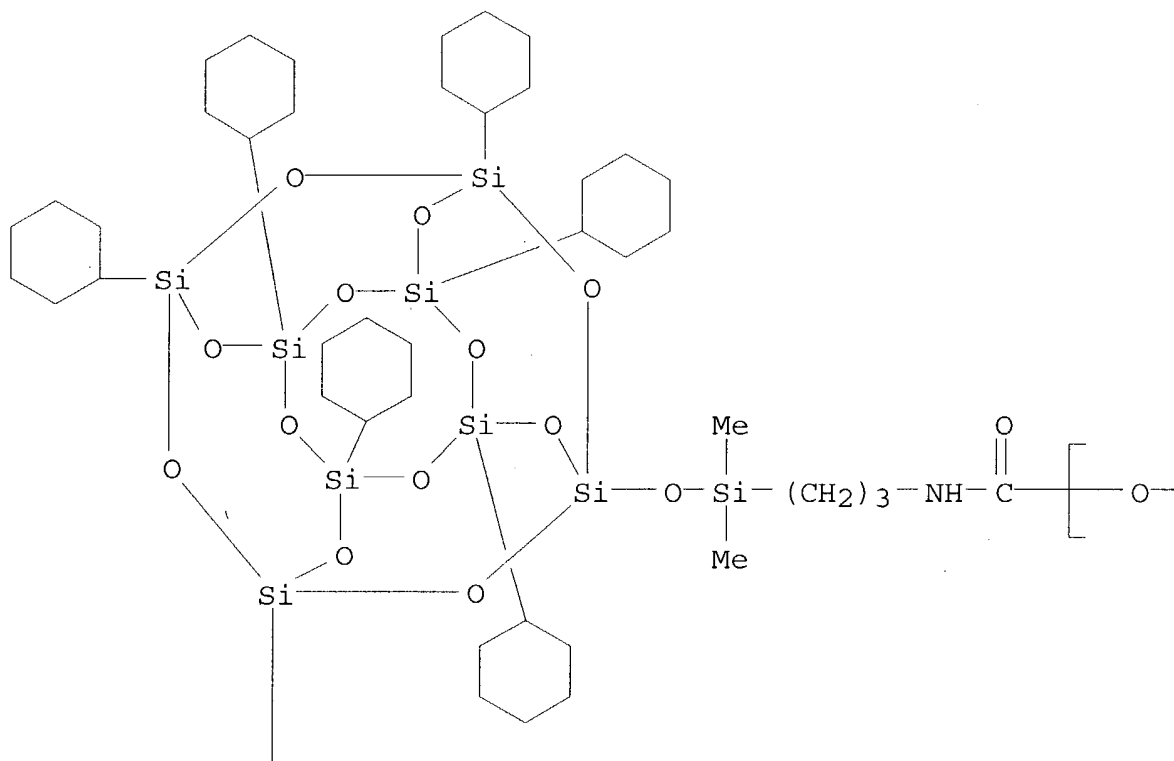
- CC 35-4 (Chemistry of Synthetic High Polymers)
Section cross-reference(s): 36
- ST glass temp hydroxystyrene vinylpyrrolidone isobutylstyryl deriv
copolymer; **polyhedral oligosilsesquioxane**
isobutylstyryl copolymer glass temp
- IT Glass transition temperature
(of poly(hydroxystyrene-co-vinylpyrrolidone-co-isobutylstyryl
polyhedral oligosilsesquioxanes))
- IT Silsesquioxanes
(vinyl copolymers; of poly(hydroxystyrene-co-vinylpyrrolidone-co-
isobutylstyryl **polyhedral oligosilsesquioxanes**
))
- IT **477782-46-ODP**, deacetylated **477782-46-OP**
(prepn. and glass temp. of)
- L45 ANSWER 4 OF 13 HCA COPYRIGHT 2003 ACS on STN
137:385187 Amphiphilic Telechelics Incorporating **Polyhedral**
Oligosilsesquioxane: 1. Synthesis and Characterization.
Kim, Byoung-Suhk; Mather, Patrick T. (Polymer Program and Department
of Chemical Engineering, University of Connecticut, Storrs, CT,
06269-3136, USA). Macromolecules, 35(22), 8378-8384 (English) 2002.
CODEN: MAMOBX. ISSN: 0024-9297. Publisher: American Chemical
Society.
- AB Well-defined amphiphilic telechelics incorporating
polyhedral oligosilsesquioxane (POSS) were
synthesized by direct urethane linkage between the diol end groups
of poly(ethylene glycol) (PEG) homopolymers and the monoisocyanate
group of POSS macromers. The hydrophobicity of the amphiphilic
telechelics was varied by using a series of PEG homopolymers of
increasing mol. wt., resulting in control over mol. architecture by
hydrophilic/hydrophobic balance. The synthesized amphiphilic
telechelics were characterized by ¹H NMR, FT-IR, GPC, DSC, and TGA,
showed a relatively narrow and unimodal mol. wt. distribution (Mw/Mn
< 1.1) that had close to 2.0 end groups per PEG chain, and revealed
strongly modified thermal behavior. Amphiphilic telechelics with
POSS contents of 19.8, 23.6, 40.7, 52.7, and 68.1% depending on the
mol. wts. of PEG homopolymers could be obtained. Modification to
crystn. behavior is obsd. and attributed to the bulkiness of POSS
groups with respect to cryst. lamellae dimensions.
- IT **476168-99-7P**
(prepn. and characterization of amphiphilic telechelics)

incorporating **polyhedral oligosilsesquioxane**)

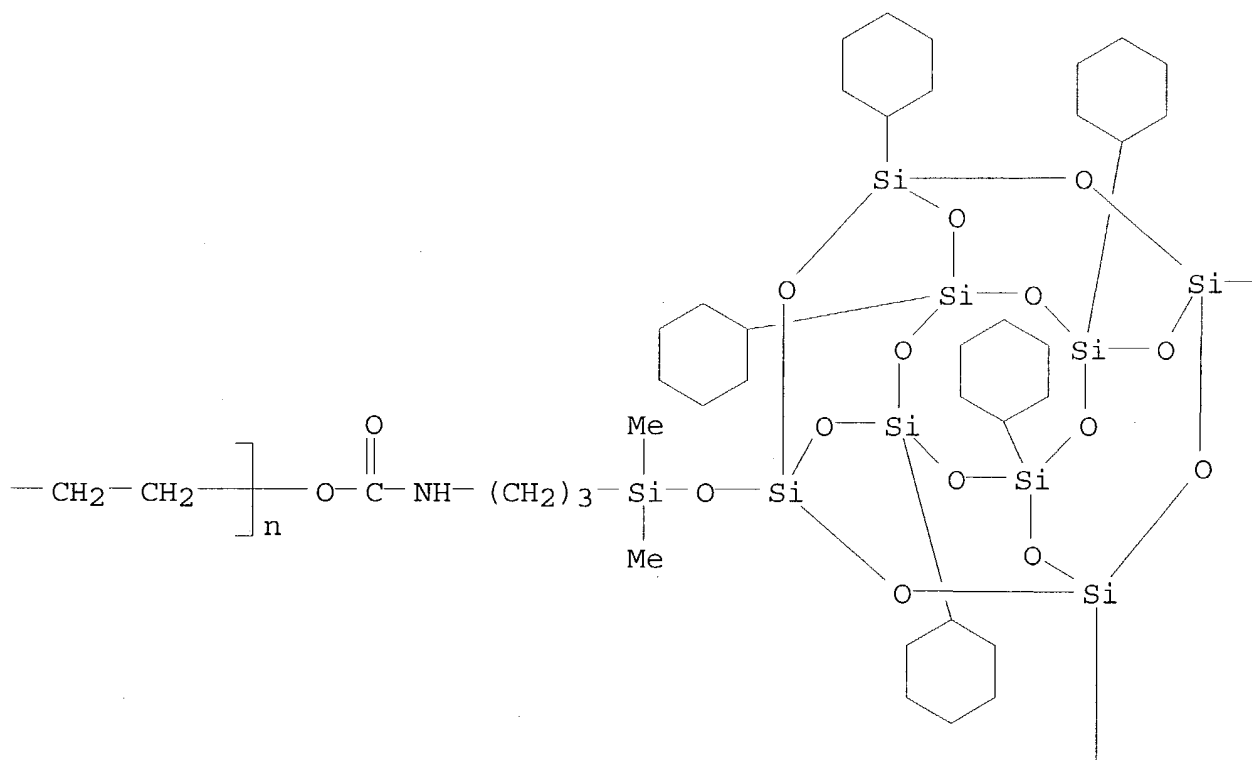
RN 476168-99-7 HCA

CN Poly(oxy-1,2-ethanediyl), .alpha.-[[[3-[[[heptacyclohexylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)oxy]dimethylsilyl]propyl]amino]carbonyl]-.omega.-[[[3-[[[heptacyclohexylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)oxy]dimethylsilyl]propyl]amino]carbonyl]oxy]-(9CI) (CA INDEX NAME)

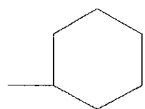
PAGE 1-A



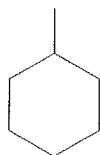
PAGE 1-B



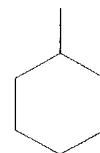
PAGE 1-C



PAGE 2-A



PAGE 2-B



- CC 35-8 (Chemistry of Synthetic High Polymers)
- ST polyoxyethylene isocyanato **oligosilsesquioxane** reaction
product prepn property
- IT Polyoxyalkylenes, reactions
Silsesquioxanes
(in prepn. and characterization of amphiphilic telechelics
incorporating **polyhedral oligosilsesquioxane**)
- IT Silsesquioxanes
(polyether-; prepn. and characterization of amphiphilic
telechelics incorporating **polyhedral
oligosilsesquioxane**)
- IT Amphiphiles
Glass transition temperature
Molecular weight
Molecular weight distribution
Phase transition temperature
(prepn. and characterization of amphiphilic telechelics
incorporating **polyhedral oligosilsesquioxane**)
- IT Polyethers, preparation
(silsesquioxane-; prepn. and characterization of amphiphilic
telechelics incorporating **polyhedral
oligosilsesquioxane**)
- IT 25322-68-3, Poly(ethylene glycol) 476168-98-6
(in prepn. and characterization of amphiphilic telechelics
incorporating **polyhedral oligosilsesquioxane**)
- IT **476168-99-7P**
(prepn. and characterization of amphiphilic telechelics
incorporating **polyhedral oligosilsesquioxane**)
- L45 ANSWER 5 OF 13 HCA COPYRIGHT 2003 ACS on STN
137:385162 Preparations, Thermal Properties, and Tg Increase Mechanism
of Inorganic/Organic Hybrid Polymers Based on Polyhedral Oligomeric
Silsesquioxanes. Xu, Hongyao; Kuo, Shiao-Wei; Lee, Juh-Shyong;

Chang, Feng-Chih (Department of Applied Chemistry, National Chiao-Tung University, Hsin Chu, Taiwan). *Macromolecules*, 35(23), 8788-8793 (English) 2002. CODEN: MAMOBX. ISSN: 0024-9297. Publisher: American Chemical Society.

AB A series of novel hybrid poly(acetoxystyrene-co-isobutylstyryl-POSS)s (PAS-POSS) and poly(vinylpyrrolidone-co-isobutylstyryl-POSS)s (PVP-POSS) was synthesized and characterized. The POSS content in these hybrids can be controlled by varying the monomer feed ratio. The **polyhedral oligosilsesquioxane** (POSS) moiety can effectively increase the T_g of the resultant org./inorg. hybrid polymer at a relatively high POSS content and produce the hybrid copolymer with narrower mol. wt. distribution. The FTIR spectra are used to investigate the structure-property relationship of these hybrid polymers, and the T_g enhancement mechanism is discussed in detail.

IT **476012-71-2P 476012-72-3P**
(prepn. and glass temp. of)

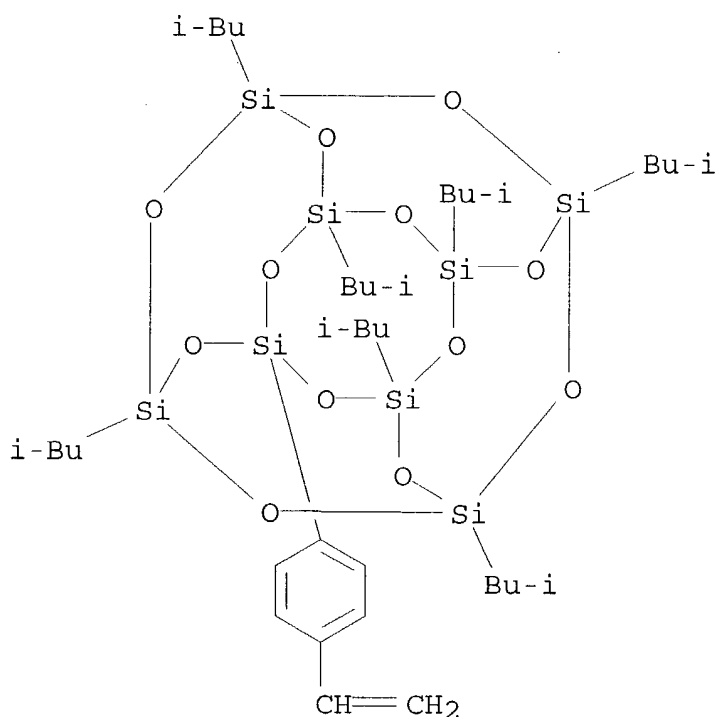
RN 476012-71-2 HCA

CN 2-Pyrrolidinone, 1-ethenyl-, polymer with (4-ethenylphenyl)heptakis(2-methylpropyl)pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane (9CI) (CA INDEX NAME)

CM 1

CRN 446276-27-3

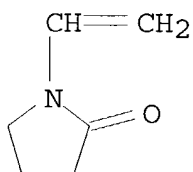
CMF C36 H70 O12 Si8



CM 2

CRN 88-12-0

CMF C6 H9 N O



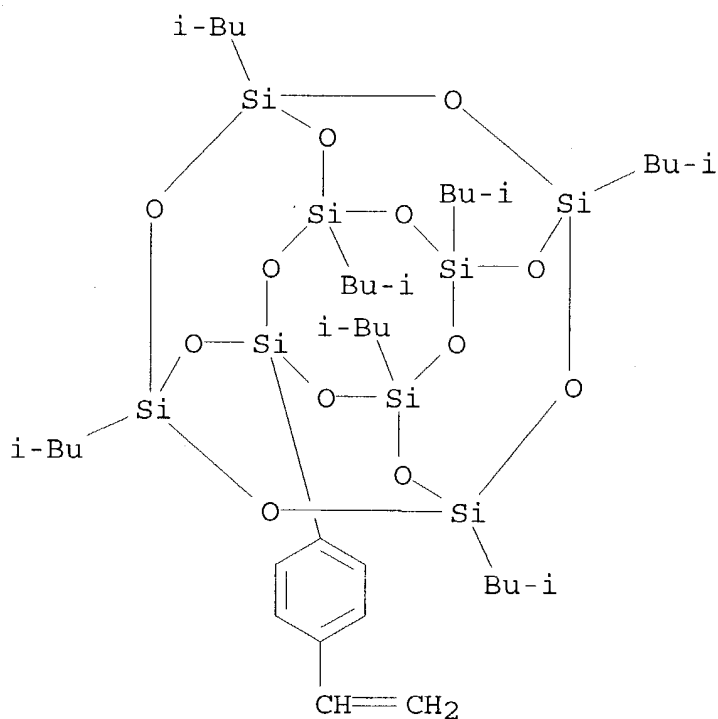
RN 476012-72-3 HCA

CN Phenol, 4-ethenyl-, acetate, polymer with (4-ethenylphenyl)heptakis(2-methylpropyl)pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane (9CI) (CA INDEX NAME)

CM 1

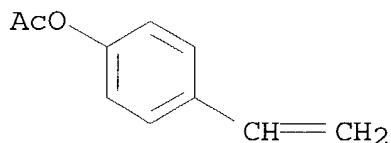
CRN 446276-27-3

CMF C36 H70 O12 Si8



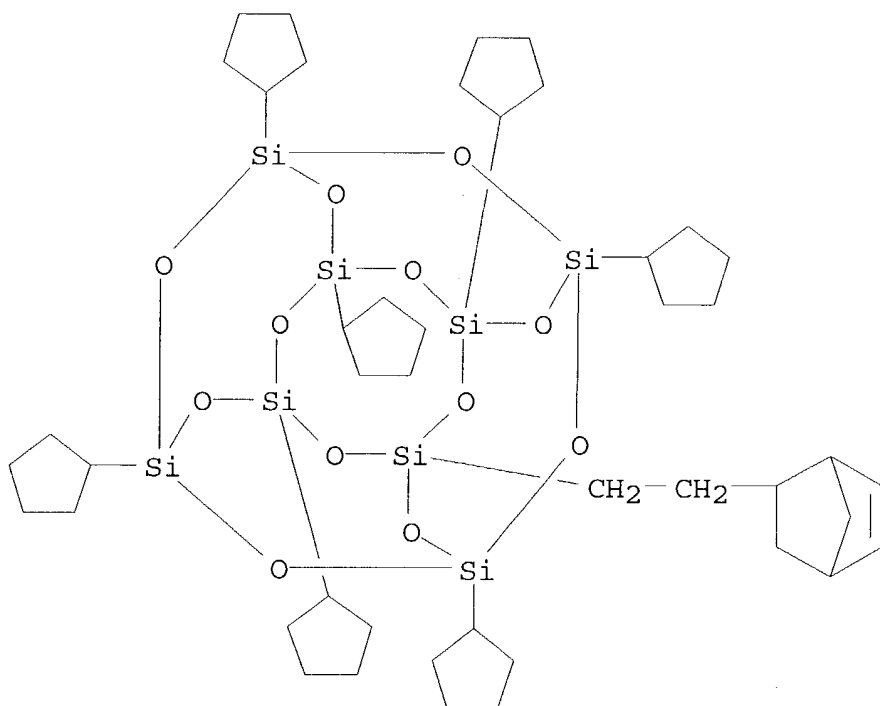
CM 2

CRN 2628-16-2
CMF C10 H10 O2



- CC 35-4 (Chemistry of Synthetic High Polymers)
ST **polyhedral oligosilsesquioxane** vinyl polymer
prepn property; acetoxystyrene **polyhedral**
oligosilsesquioxane polymer prepn property; vinylpyrrolidone
polyhedral oligosilsesquioxane polymer prepn
property; glass temp vinyl **polyhedral**
oligosilsesquioxane polymer
IT Glass transition temperature
(of **polyhedral oligosilsesquioxane**-contg.
vinyl polymers)
IT **476012-71-2P 476012-72-3P**
(prepn. and glass temp. of)
- L45 ANSWER 6 OF 13 HCA COPYRIGHT 2003 ACS on STN
133:296803 Synthesis and properties of polyolefin hybrid copolymers
containing **polyhedral oligosilsesquioxane**
(POSS). Zheng, Lei; Farris, Richard J.; Coughlin, E. Bryan (Polymer
Science and Engineering Department, University of Massachusetts,
Amherst, MA, 01003, USA). Polymer Preprints (American Chemical
Society, Division of Polymer Chemistry), 41(2), 1929-1930 (English)
2000. CODEN: ACPPAY. ISSN: 0032-3934. Publisher: American
Chemical Society, Division of Polymer Chemistry.
- AB Two different synthetic routes for prep. polyolefin-polyhedral
oligomeric silsesquioxane (POSS) copolymers were described. The
ring opening metathesis copolymn. of cyclooctene and
cyclopentyl-POSS-norbornene monomer afforded, initially, an
elastomeric copolymer that could be subsequently hydrogenated to
give a hybrid polyethylene-POSS copolymer. An alternative synthesis
is the direct copolymn. of ethylene and cyclopentyl-POSS-norbornene
monomer using metallocene catalysis. Preliminary results point to
improved thermal stability of these hybrid copolymers relative to
polyethylene.
- IT **301538-83-0DP**, hydrogenated **301538-84-1P**
(prepn. and characterization of)
RN 301538-83-0 HCA
CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, (2-
bicyclo[2.2.1]hept-5-en-2-ylethyl)heptacyclopentyl-, polymer with
cyclooctene (9CI) (CA INDEX NAME)
- CM 1
CRN 188859-53-2

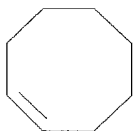
CMF C44 H76 O12 Si8



CM 2

CRN 931-88-4

CMF C8 H14

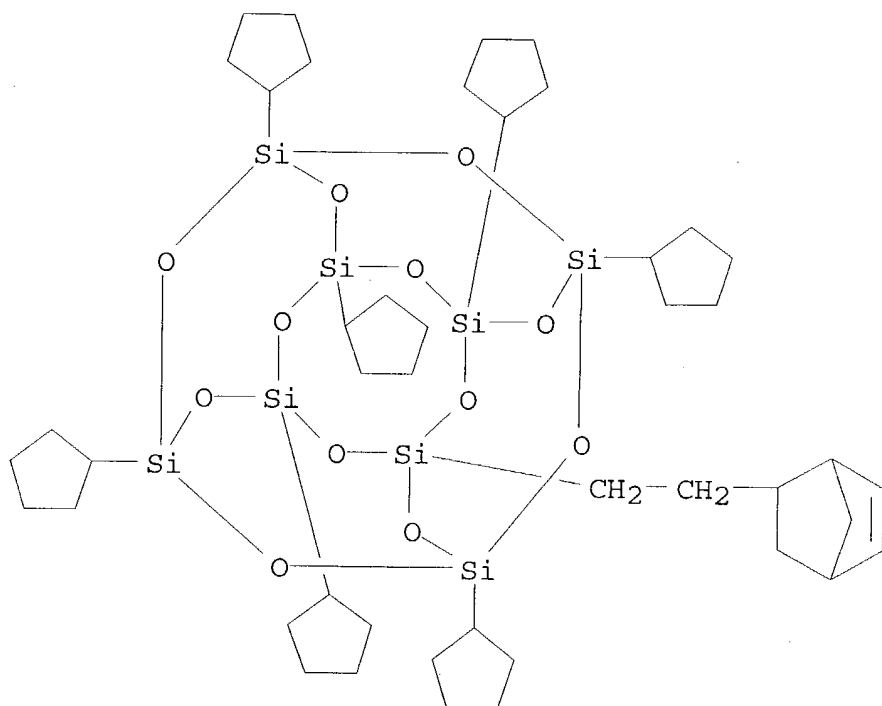


RN 301538-84-1 HCA
 CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, (2-bicyclo[2.2.1]hept-5-en-2-ylethyl)heptacyclopentyl-, polymer with ethene (9CI) (CA INDEX NAME)

CM 1

CRN 188859-53-2

CMF C44 H76 O12 Si8



CM 2

CRN 74-85-1

CMF C2 H4

H₂C=CH₂

CC 35-7 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 39

ST ethylene **polyhedral oligosilsesquioxane**norbornene copolymer hybrid; cyclooctene **polyhedral****oligosilsesquioxane** norbornene copolymer hybrid; polymnethylene **polyhedral oligosilsesquioxane**

norbornene; metathesis ring opening polymn cyclooctene norbornene

IT **301538-83-ODP**, hydrogenated **301538-84-1P**

(prepn. and characterization of)

L45 ANSWER 7 OF 13 HCA COPYRIGHT 2003 ACS on STN

132:348081 Strain recovery in POSS hybrid thermoplastics. Mather, Patrick T.; Jeon, Hong G.; Haddad, T. S. (Polymer Program, Institute of Materials Science, University of Connecticut, Storrs, CT, 06269-3136, USA). Polymer Preprints (American Chemical Society, Division of Polymer Chemistry), 41(1), 528-529 (English) 2000. CODEN: ACPPAY. ISSN: 0032-3934. Publisher: American Chemical Society, Division of Polymer Chemistry.

AB Polyhedral oligomeric silsesquioxane (POSS) macromer consist of a well-defined cluster inorg. silica-like core surrounded by org. corner groups only one being reactive for polymn. The goal is to develop compn.-microstructure and microstructure-property relationships for POSS materials with particular focus on mech. relaxation behavior. As such, we will report the microstructure and mech. properties of the polynorbornene-POSS copolymer system in which we have systematically varied the nonreactive corner group, R, and the mole fraction of POSS present in random copolymers. In particular, we will discuss interesting "shape-memory" behavior obsd. for drawn specimens and detail the impact of POSS incorporation on such characteristics as strain recovery, recovery rate, and retraction stability. The origin of shape-memory alteration with POSS incorporation is discussed with respect to nanostructures formed as revealed by transmission electron microscopy.

IT 188859-54-3 188859-55-4

(mech. relaxation behavior of pendant **polyhedral oligosilsesquioxane**-contg. polynorbornene)

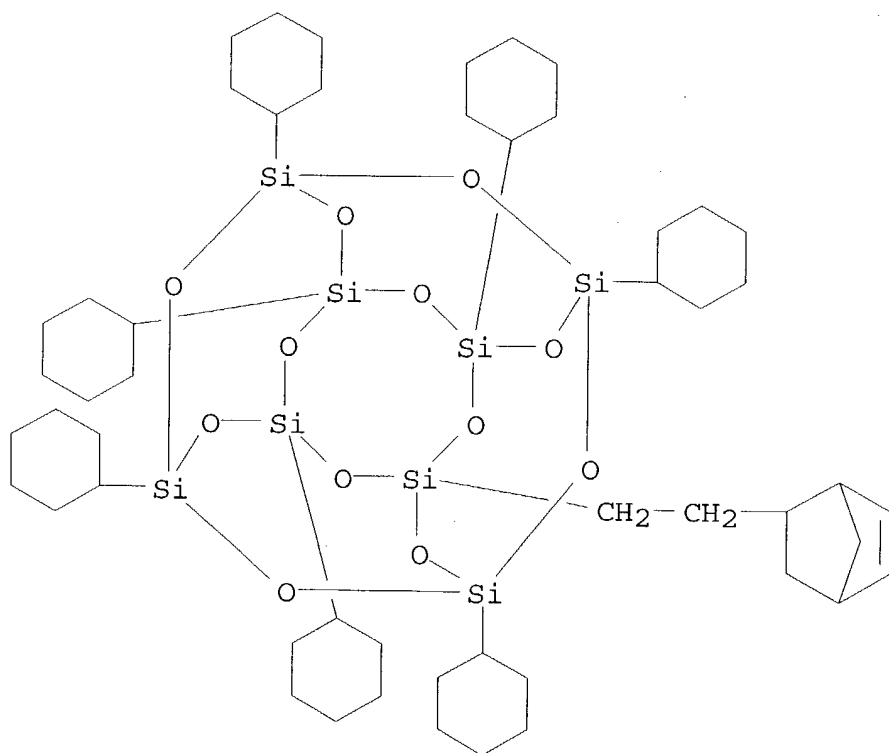
RN 188859-54-3 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, (2-bicyclo[2.2.1]hept-5-en-2-ylethyl)heptacyclohexyl-, polymer with bicyclo[2.2.1]hept-2-ene (9CI) (CA INDEX NAME)

CM 1

CRN 188859-52-1

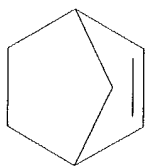
CMF C51 H90 O12 Si8



CM 2

CRN 498-66-8

CMF C7 H10



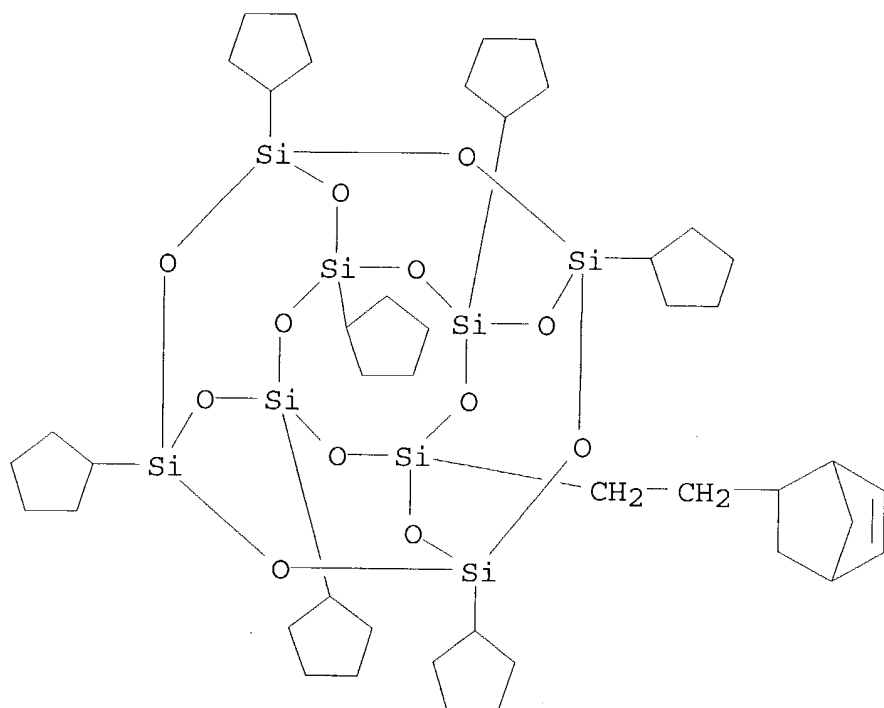
RN 188859-55-4 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, (2-bicyclo[2.2.1]hept-5-en-2-ylethyl)heptacyclopentyl-, polymer with bicyclo[2.2.1]hept-2-ene (9CI) (CA INDEX NAME)

CM 1

CRN 188859-53-2

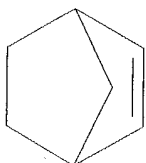
CMF C44 H76 O12 Si8



CM 2

CRN 498-66-8

CMF C7 H10



CC 35-7 (Chemistry of Synthetic High Polymers)
 ST **polyhedral oligosilsesquioxane** contg
 polynorbornene property
 IT Mechanical relaxation
 Molecular structure-property relationship
 Nanostructures
 Polymer chains
 (mech. relaxation behavior of pendant **polyhedral
 oligosilsesquioxane**-contg. polynorbornene)
 IT 188859-54-3 188859-55-4
 (mech. relaxation behavior of pendant **polyhedral
 oligosilsesquioxane**-contg. polynorbornene)

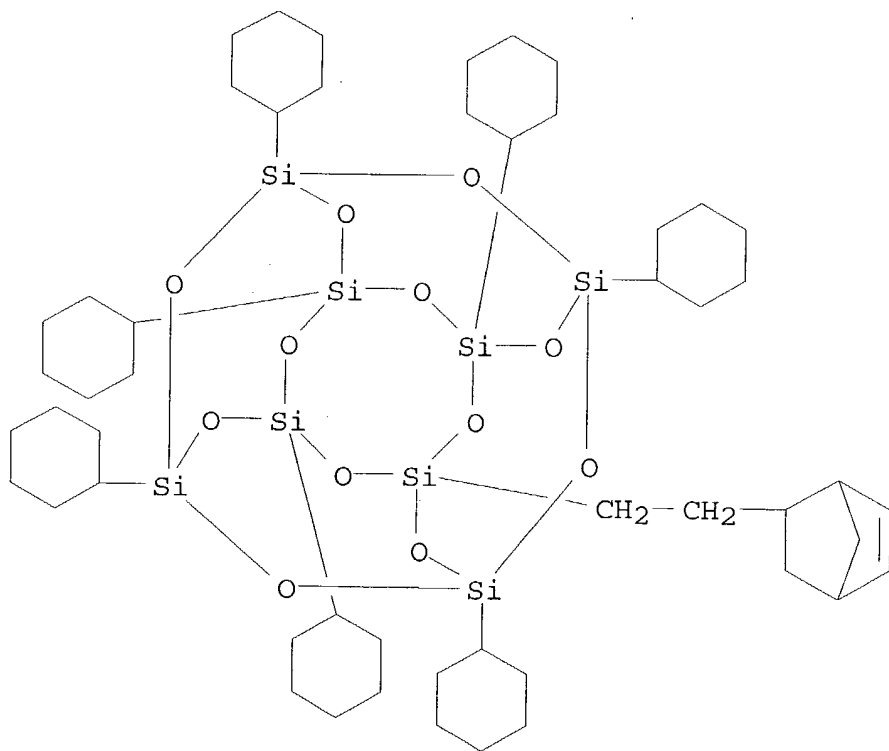
L45 ANSWER 8 OF 13 HCA COPYRIGHT 2003 ACS on STN

- 132:335303 Molecular dynamics simulation study of norbornene-POSS polymers. Bharadwaj, R. K.; Berry, R. J.; Farmer, B. L. (Systran Federal Corporation, Dayton, OH, 45431, USA). Polymer Preprints (American Chemical Society, Division of Polymer Chemistry), 41(1), 530-531 (English) 2000. CODEN: ACPPAY. ISSN: 0032-3934. Publisher: American Chemical Society, Division of Polymer Chemistry.
- AB The effects of introducing polyhedral oligomeric silsesquioxane (POSS) into polymeric chains as pendant groups are explored via atomistic mol. dynamics simulations. The simulation predicted that vol.-temp. properties and x-ray scattering intensities are in good agreement with exptl. results for all the polymers studied.
- IT 188859-54-3 188859-55-4
(mol. dynamics simulation study of norbornene-**polyhedral oligosilsesquioxane** polymers)
- RN 188859-54-3 HCA
- CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, (2-bicyclo[2.2.1]hept-5-en-2-ylethyl)heptacyclohexyl-, polymer with bicyclo[2.2.1]hept-2-ene (9CI) (CA INDEX NAME)

CM 1

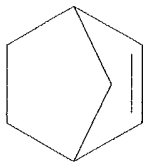
CRN 188859-52-1

CMF C51 H90 O12 Si8



CM 2

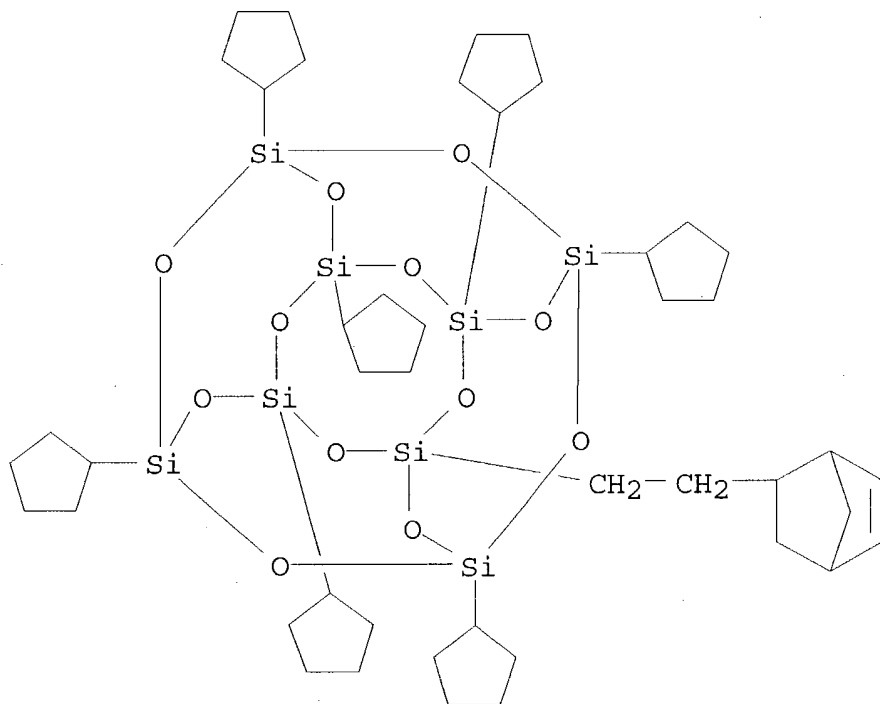
CRN 498-66-8
CMF C7 H10



RN 188859-55-4 HCA
CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, (2-bicyclo[2.2.1]hept-5-en-2-ylethyl)heptacyclopentyl-, polymer with bicyclo[2.2.1]hept-2-ene (9CI) (CA INDEX NAME)

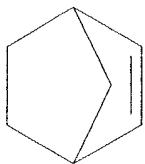
CM 1

CRN 188859-53-2
CMF C44 H76 O12 Si8



CM 2

CRN 498-66-8
CMF C7 H10



- CC 37-5 (Plastics Manufacture and Processing)
Section cross-reference(s): 36
- IT Polymer chains
(conformation; mol. dynamics simulation study of norbornene-**polyhedral oligosilsesquioxane** polymers)
- IT Atomistic simulation
Glass transition temperature
Tensile strength
Thermal expansion
Young's modulus
(mol. dynamics simulation study of norbornene-**polyhedral oligosilsesquioxane** polymers)
- IT Simulation and Modeling, physicochemical
(mol. dynamics; of norbornene-**polyhedral oligosilsesquioxane** polymers)
- IT 25038-76-0 188859-54-3 188859-55-4
(mol. dynamics simulation study of norbornene-**polyhedral oligosilsesquioxane** polymers)
- L45 ANSWER 9 OF 13 HCA COPYRIGHT 2003 ACS on STN
131:102611 Functionalized **polyhedral oligosilsesquioxane** (POSS) macromers: new graftable POSS hydride, POSS .alpha.-olefin, POSS epoxy, and POSS chlorosilane macromers and POSS-siloxane triblocks. Shockey, Edward G.; Bolf, Alan G.; Jones, Paul F.; Schwab, Joseph J.; Chaffee, Kevin P.; Haddad, Timothy S.; Lichtenhan, Joseph D. (Phillips Laboratory, Propulsion Directorate, Hughes STX Corporation, Edwards AFB, CA, 93524-7680, USA). Applied Organometallic Chemistry, 13(4), 311-327 (English) 1999. CODEN: AOCHEX. ISSN: 0268-2605. Publisher: John Wiley & Sons Ltd..
- AB A series of polyhedral oligomeric silsesquioxanes (POSS) monomers bearing silane or .alpha.-olefin substituents have been prepd. and their chem. explored. Both the POSS silanes and .alpha.-olefin monomers readily participate in hydrosilation chem. and were used as starting materials for the prepn. of POSS sol-gel-type reagents. Similarly, POSS silanes and .alpha.-olefins are reactive towards silane- and olefin-functionalized polymers, which makes them useful as grafting reagents. The utility of these reagents as graftable monomers was demonstrated by synthesis of a series of POSS-siloxane-POSS triblock polymers. Thermal and X-ray diffraction characterization of the triblock polymers was performed in order to examine how the length of the siloxane segment affects the properties of the polymer. The POSS .alpha.-olefin monomers were found to be unreactive with respect to Ziegler-Natta polymn. The

reaction of POSS .alpha.-olefins with m-chloroperbenzoic acid to give POSS epoxides was demonstrated and the thermal stability of the POSS epoxides detd.

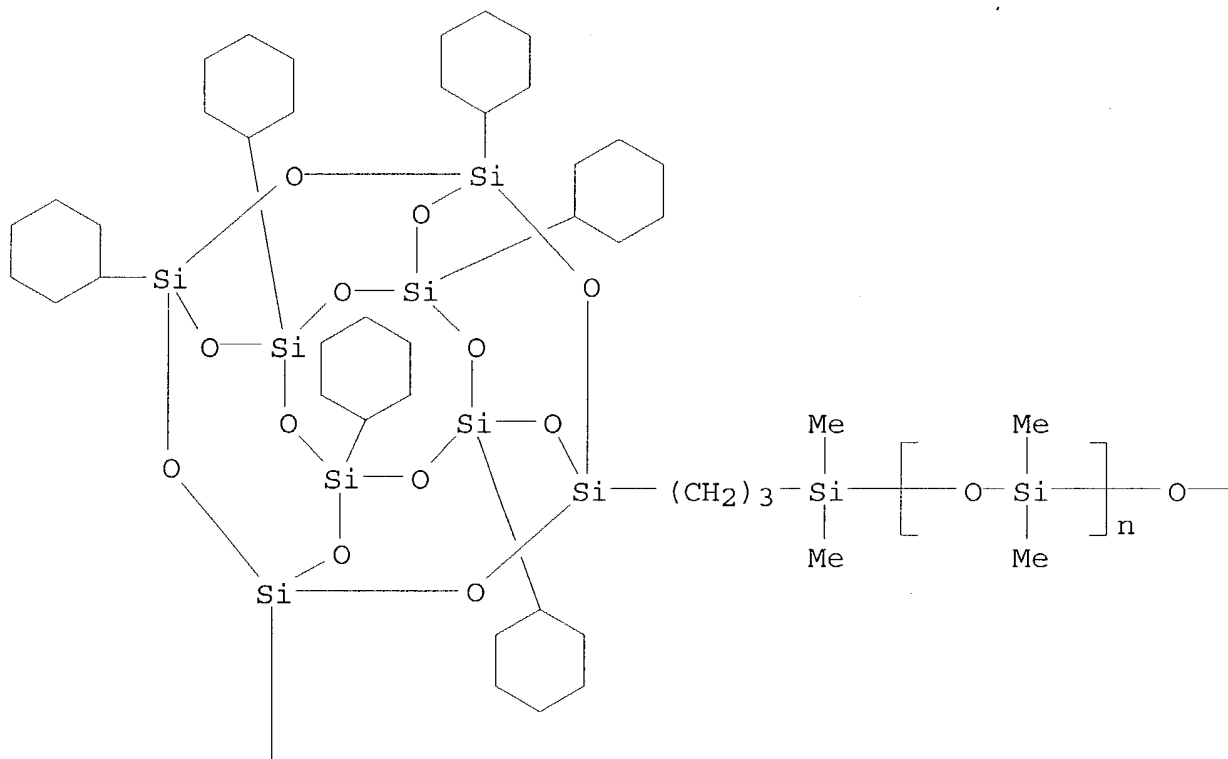
IT 230316-10-6P 230316-11-7P

(prepn. and characterization of)

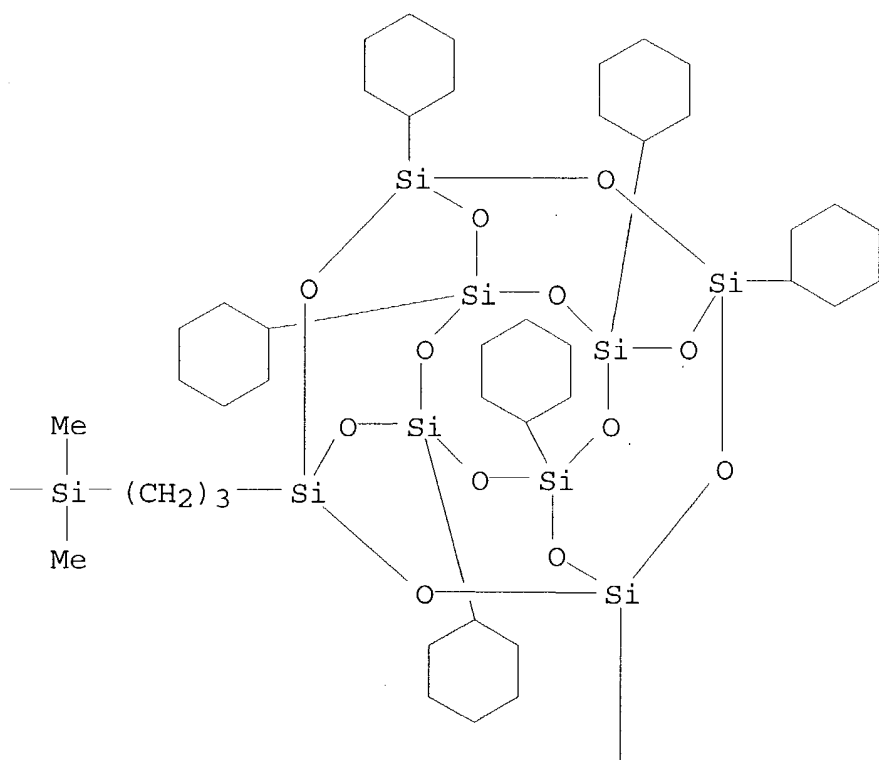
RN 230316-10-6 HCA

CN Poly[oxy(dimethylsilylene)], .alpha.-'[[3-(heptacyclohexylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)propyl]dimethylsilyl]-.omega.-[[[3-(heptacyclohexylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)propyl]dimethylsilyl]oxy]- (9CI) (CA INDEX NAME)

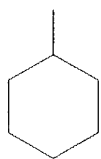
PAGE 1-A



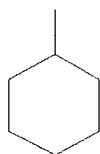
PAGE 1-B



PAGE 2-A



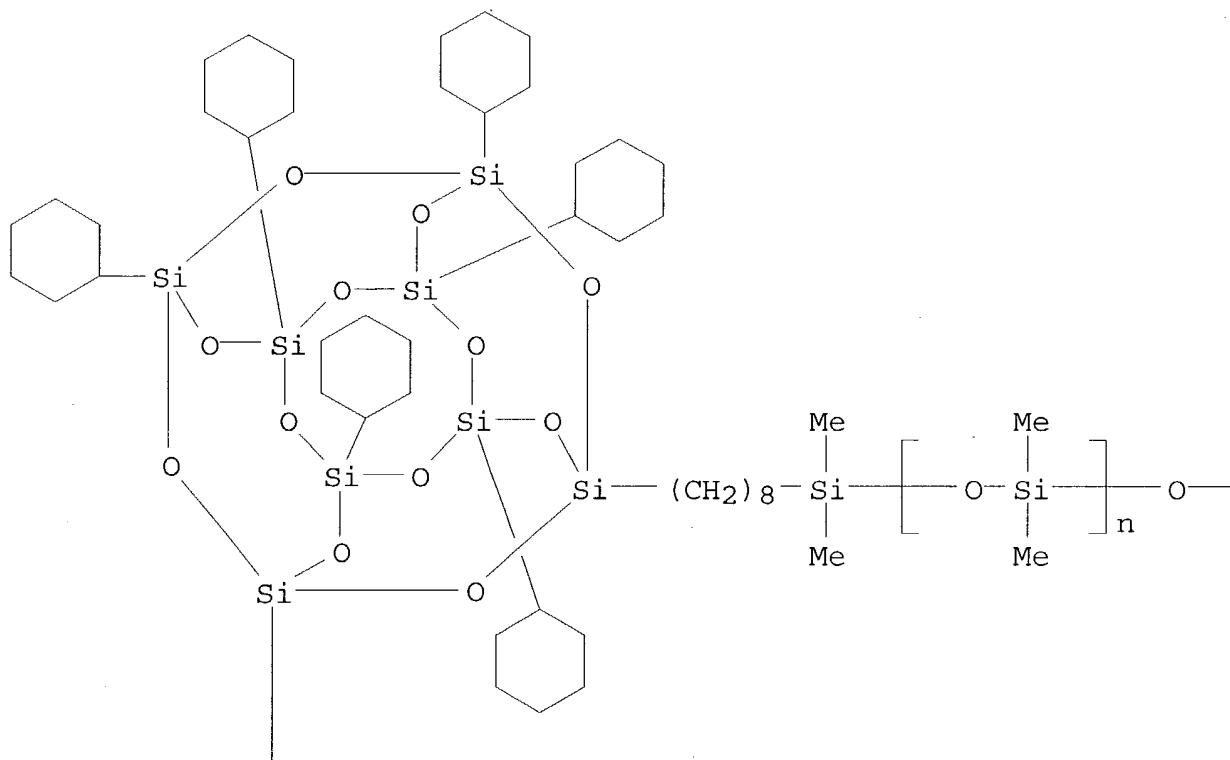
PAGE 2-B



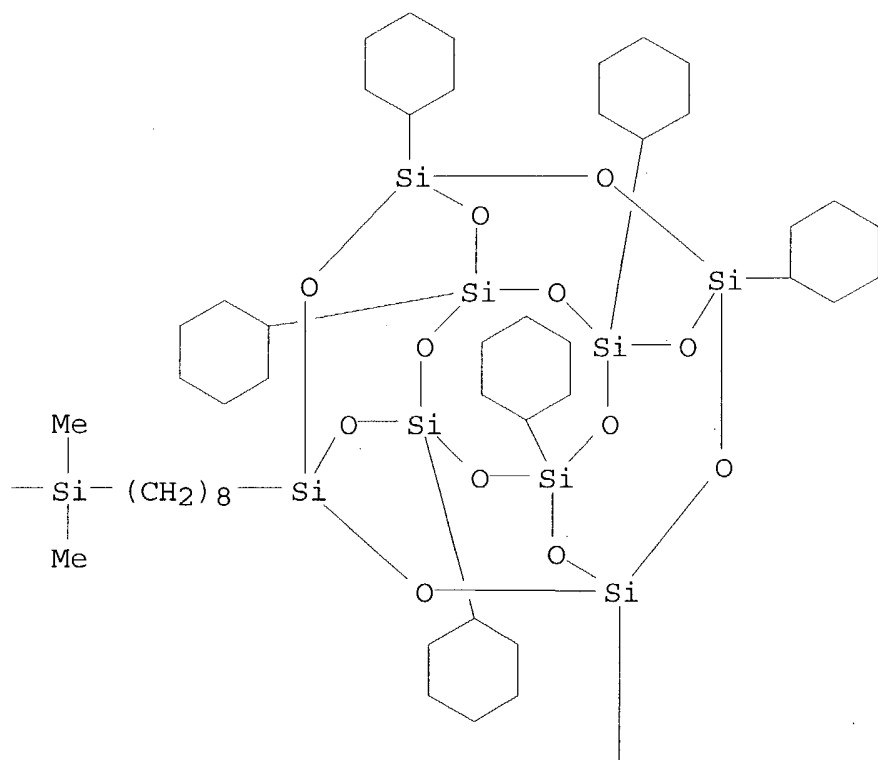
RN 230316-11-7 HCA
 CN Poly[oxy(dimethylsilylene)], .alpha.-[[8-(heptacyclohexylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)octy

1]dimethylsilyl]-.omega.-[[[8-(heptacyclohexylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)octyl]dimethylsilyl]oxy]- (9CI) (CA INDEX NAME)

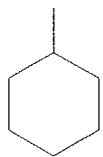
PAGE 1-A



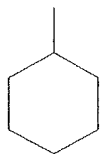
PAGE 1-B



PAGE 2-A



PAGE 2-B



CC 35-6 (Chemistry of Synthetic High Polymers)
 ST functionalized **polyhedral oligosilsesquioxane**
 macromer; hydride **polyhedral oligosilsesquioxane**

macromer; olefin **polyhedral oligosilsesquioxane**
 macromer; epoxy **polyhedral oligosilsesquioxane**
 macromer; chlorosilane **polyhedral**
oligosilsesquioxane macromer

- IT Polysiloxanes, preparation
 (polyhedral oligosilsesquioxane-contg.;
 prepn. and characterization of)
- IT Macromonomers
 (prepn. of **polyhedral oligosilsesquioxane**
 macromers)
- IT 75-54-7, Dichloromethylsilane 75-94-5, Vinyltrichlorosilane
 107-37-9, Allyltrichlorosilane 937-14-4 1066-35-9,
 Chlorodimethylsilane 4115-83-7 10025-78-2, Trichlorosilane
 10026-04-7, Tetrachlorosilane 166437-91-8, 1-
 Octenyltrichlorosilane 216972-57-5 230316-14-0
 (in prepn. of **polyhedral oligosilsesquioxane**
 macromers)
- IT 3809-29-8DP, reaction products with vinyl-terminated polysiloxanes
 3809-29-8P 9016-00-6DP, Dimethylsilanediol homopolymer, sru,
 .alpha., .omega.-bis[(cyclohexyl)7Si8O12CH2CH2]methylsilyl-
 terminated 31900-57-9DP, Dimethylsilanediol homopolymer,
 vinyl-terminated, reaction products with polyhedral oligomeric
 silsesquioxane 31900-57-9DP, Dimethylsilanediol homopolymer,
 .alpha., .omega.-bis[(cyclohexyl)7Si8O12CH2CH2]methylsilyl-
 terminated 156048-34-9DP, Dimethylsilanediol-diphenylsilanediol
 copolymer, vinyl-terminated, reaction products with polyhedral
 oligomeric silsesquioxane 205131-80-2P 205131-81-3P
 209913-35-9P 213453-16-8DP, reaction products with
 vinyl-terminated polysiloxanes 213453-16-8P 214675-88-4P
 220001-32-1P 230316-01-5P 230316-02-6P 230316-03-7DP, reaction
 products with vinyl-terminated polysiloxanes 230316-03-7P
 230316-04-8P 230316-05-9P 230316-06-0P 230316-07-1P
 230316-08-2P 230316-09-3P **230316-10-6P**
230316-11-7P 230316-12-8P 230316-13-9P
 (prepn. and characterization of)
- L45 ANSWER 10 OF 13 HCA COPYRIGHT 2003 ACS on STN
 131:102321 Silsesquioxane-Based Amphiphiles. Knischka, Ralf; Dietsche,
 Frank; Hanselmann, Ralf; Frey, Holger; Muelhaupt, Rolf; Lutz, Pierre
 J. (Institut fuer Makromolekulare Chemie und Freiburger
 Materialforschungszentrum (FMF), Albert-Ludwigs-Universitaet
 Freiburg, Freiburg, D-79104, Germany). Langmuir, 15(14), 4752-4756
 (English) 1999. CODEN: LANGD5. ISSN: 0743-7463. Publisher:
 American Chemical Society.
- AB A novel type of amphiphilic spherosilsesquioxane deriv.,
 1-(1,.omega.-propylenemethoxy)oligo(ethylene oxide)-3,5,7,9,11,13,15-
 heptahydridopentacyclo[9.5.13,9.15,15.17,13]octasiloxane was prepd.
 from (HSiO3/2)8 and allyl-functional oligo(ethylene oxide) (Mn = 750
 g/mol) by hydrosilylation. The monosubstituted
 octahydridosilsesquioxane was characterized by 1H, 13C, and 29Si NMR
 spectroscopy, IR, and MALDI-TOF mass spectroscopy as well as
 elemental anal. Surface tension measurements of the water-sol.

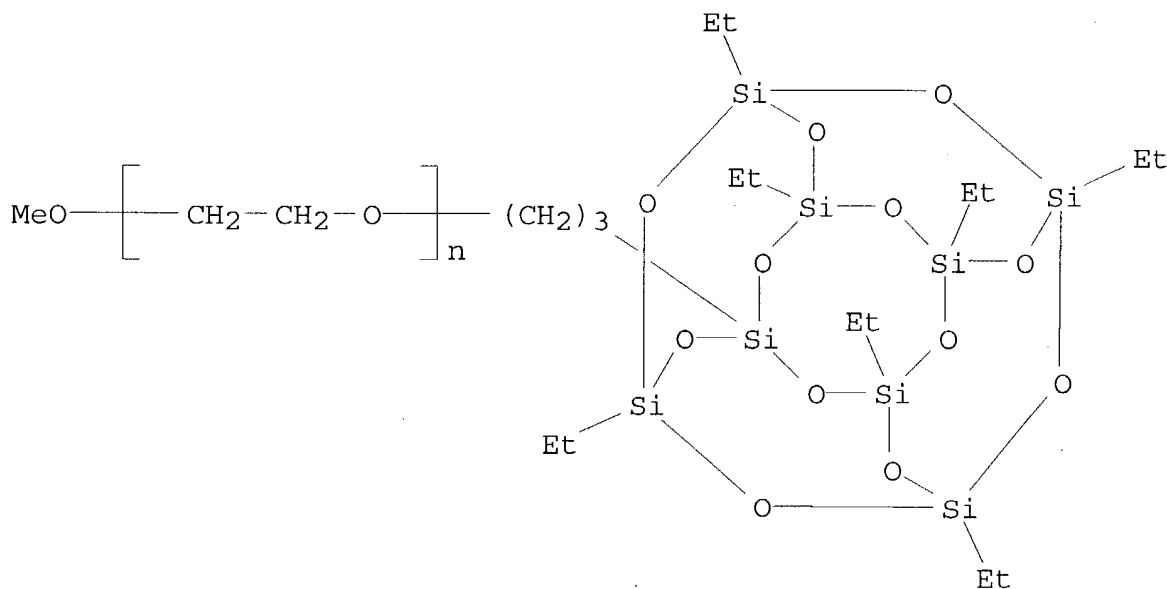
amphiphile show a cmc in the range of 6 .times. 10⁻⁴ mol/L. Aggregation of the uncondensed amphiphile leads to micellar and vesicular structures that can be cross-linked to liposome-like silica particles at elevated pH.

IT 230952-26-8P

(surface tension, MALDI-TOF mass spectra; prepn. of silsesquioxane-based amphiphiles)

RN 230952-26-8 HCA

CN Poly(oxy-1,2-ethanediyl), .alpha.-[3-(heptaethylpentacyclo[9.5.1.13, 9.15,15.17,13]octasiloxanyl)propyl]-.omega.-methoxy- (9CI) (CA INDEX NAME)

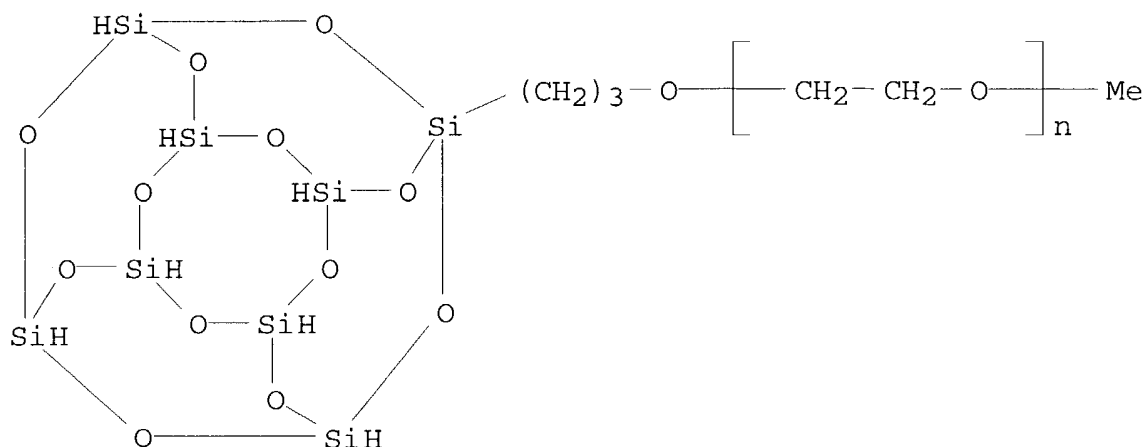


IT 230952-25-7P

(surface tension, TEM, MALDI-TOF mass spectra; prepn., properties, aggregation, and crosslinking of silsesquioxane-based amphiphile)

RN 230952-25-7 HCA

CN Poly(oxy-1,2-ethanediyl), .alpha.-methyl-.omega.-(3-pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanylpropoxy)- (9CI) (CA INDEX NAME)



CC 29-6 (Organometallic and Organometalloidal Compounds)

Section cross-reference(s): 35

ST silsesquioxane based amphiphile prepn; aggregation silsesquioxane
amphiphile micelle vesicle formation; **oligo** ethylene oxide
silsesquioxane deriv prepn

IT 230952-26-8P

(surface tension, MALDI-TOF mass spectra; prepn. of
silsesquioxane-based amphiphiles)

IT 230952-25-7P

(surface tension, TEM, MALDI-TOF mass spectra; prepn.,
properties, aggregation, and crosslinking of silsesquioxane-based
amphiphile)

L45 ANSWER 11 OF 13 HCA COPYRIGHT 2003 ACS on STN

129:136694 Viscoelastic and morphological behavior of hybrid
styryl-based polyhedral oligomeric silsesquioxane (POSS) copolymers.
Romo-Urbe, A.; Mather, P. T.; Haddad, T. S.; Lichtenhan, J. D. (Air
Force Research Laboratory, Systran Corporation, Wright-Patterson
AFB, OH, 45433-7750, USA). Journal of Polymer Science, Part B:
Polymer Physics, 36(11), 1857-1872 (English) 1998. CODEN: JPBPEM.
ISSN: 0887-6266. Publisher: John Wiley & Sons, Inc..

AB The viscoelastic behavior of linear thermoplastic nonpolar hybrid
inorg.-org. polymers are described. These materials were
synthesized through copolymn. of an oligomeric inorg. macromer with
4-methylstyrene where the inorg. portion of the material is a
well-defined **polyhedral oligosilsesquioxane**
(POSS), $\text{R}_7(\text{Si}_8\text{O}_{12})(\text{CH}_2\text{CH}_2\text{C}_6\text{H}_4\text{CH}=\text{CH}_2)$, with $\text{R} = \text{c-C}_6\text{H}_{11}$ or $\text{c-C}_5\text{H}_9$. A
series of 4-methylstyrene copolymers with approx. 4, 8, and 16 mol%
POSS macromer incorporation were investigated. Rheol. measurements
show that the polymer dynamics are profoundly affected as the
percent of POSS increases. In particular, a high-temp. rubbery
plateau develops (where a terminal zone is not obsd.), despite the
fact that the parent poly-4-methylstyrene is unentangled. It is
also obsd. that the thermal properties are influenced as the percent
of POSS incorporation increases, with increases in the glass and

decompn. temps. The results suggest that interchain interactions between the massive inorg. groups are responsible for the retardation of polymer chain motion, a mechanism similar to the sticky reptation model conceived for hydrogen-bonded elastomers and developed by Leibler et al. Control over the interchain interactions would also give rise to the obsd. increases in glass transition and the establishment of a rubbery plateau.

IT 183291-45-4 183291-46-5

(viscoelastic and morphol. behavior of hybrid methylstyryl-based polyhedral oligomeric silsesquioxane copolymers)

RN 183291-45-4 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, 1,3,5,7,9,11,13-heptacyclohexyl-15-[2-(ethenylphenyl)ethyl]-, polymer with 1-ethenyl-4-methylbenzene (9CI) (CA INDEX NAME)

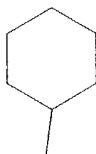
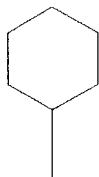
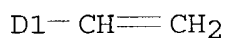
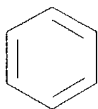
CM 1

CRN 183291-41-0

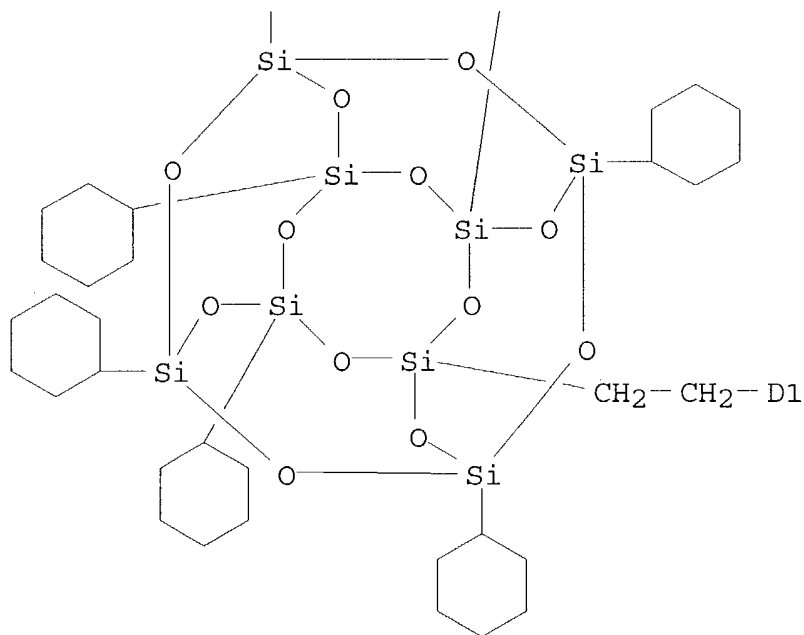
CMF C52 H88 O12 Si8

CCI IDS

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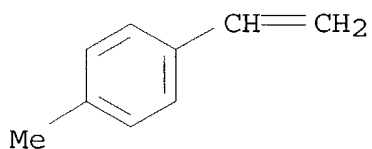
PAGE 2-A



CM 2

CRN 622-97-9

CMF C9 H10



RN 183291-46-5 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, 1,3,5,7,9,11,13-heptacyclopentyl-15-[2-(ethenylphenyl)ethyl]-, polymer with 1-ethenyl-4-methylbenzene (9CI) (CA INDEX NAME)

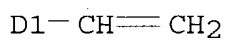
CM 1

CRN 183291-42-1

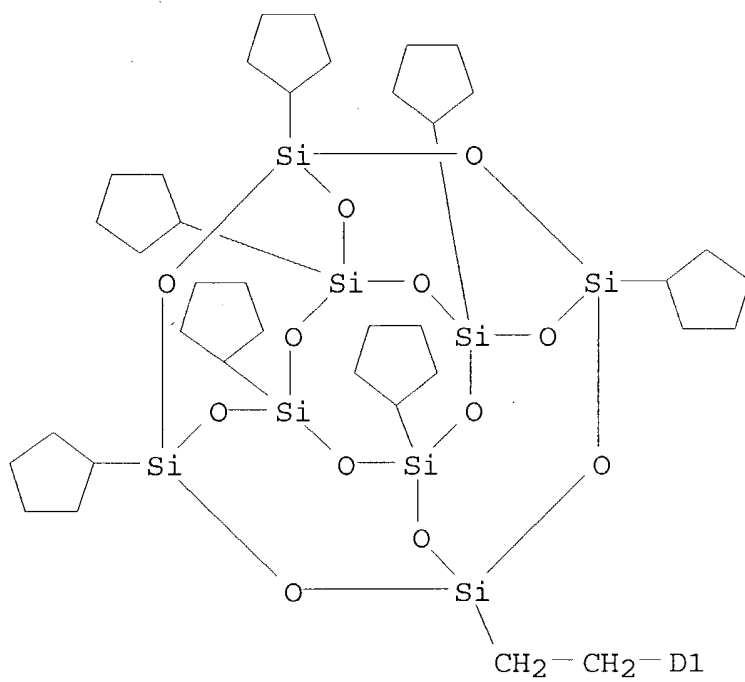
CMF C45 H74 O12 Si8

CCI IDS

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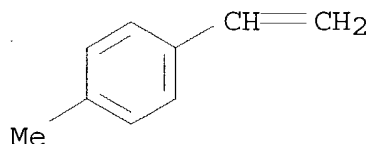
PAGE 2-A



CM 2

CRN 622-97-9

CMF C9 H10



CC 36-2 (Physical Properties of Synthetic High Polymers)

IT **183291-45-4 183291-46-5**

(viscoelastic and morphol. behavior of hybrid methylstyryl-based polyhedral oligomeric silsesquioxane copolymers)

L45 ANSWER 12 OF 13 HCA COPYRIGHT 2003 ACS on STN

126:264639 Hybrid, norbornenyl-based **polyhedral**

oligosilsesquioxane (POSS) polymers. Haddad, Timothy S.; Farris, Amy R.; Lichtenhan, Joseph D. (Phillips Lab., Hughes STX Corporation, Edwards Air Force Base, CA, 93524-7680, USA). Polymer Preprints (American Chemical Society, Division of Polymer Chemistry), 38(1), 127-128 (English) 1997. CODEN: ACPAY. ISSN: 0032-3934. Publisher: American Chemical Society, Division of Polymer Chemistry.

AB Silsesquioxanetriols were treated with norbornenylethyltrichlorosilane followed by metathesis ring-opening polymn. in the presence of various proportions of norbornene to give polymers contg. pendant **polyhedral oligosilsesquioxane**.

IT **188859-54-3P 188859-55-4P**

(prepn. of hybrid norbornenyl-based **polyhedral oligosilsesquioxane** polymers)

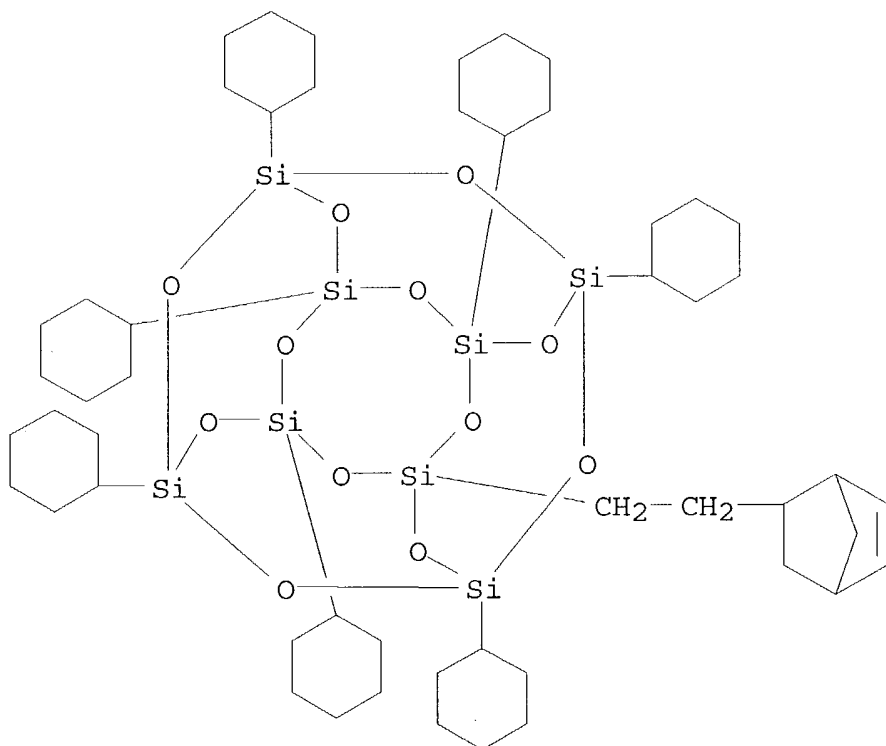
RN 188859-54-3 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, (2-bicyclo[2.2.1]hept-5-en-2-ylethyl)heptacyclohexyl-, polymer with bicyclo[2.2.1]hept-2-ene (9CI) (CA INDEX NAME)

CM 1

CRN 188859-52-1

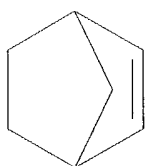
CMF C51 H90 O12 Si8



CM 2

CRN 498-66-8

CMF C7 H10



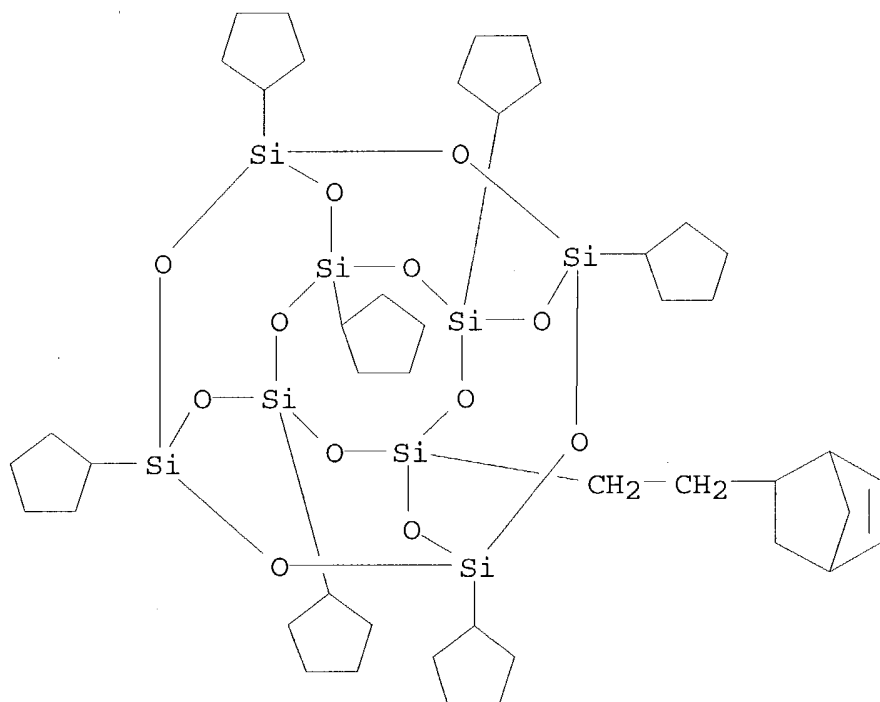
RN 188859-55-4 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, (2-bicyclo[2.2.1]hept-5-en-2-ylethyl)heptacyclopentyl-, polymer with bicyclo[2.2.1]hept-2-ene (9CI) (CA INDEX NAME)

CM 1

CRN 188859-53-2

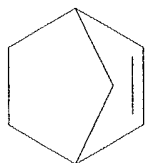
CMF C44 H76 O12 Si8



CM 2

CRN 498-66-8

CMF C7 H10



CC 37-3 (Plastics Manufacture and Processing)
 ST hybrid norbornenyl **polyhedral oligosilsesquioxane**
 polymer; silsesquioxanetriol reaction norbornenylethyltrichlorosilan
 e
 IT 47904-22-3 54076-73-2 183387-28-2
 (in prepn. of **polyhedral oligosilsesquioxane**
 macromer)
 IT **188859-54-3P 188859-55-4P**
 (prepn. of hybrid norbornenyl-based **polyhedral**
oligosilsesquioxane polymers)

L45 ANSWER 13 OF 13 HCA COPYRIGHT 2003 ACS on STN
 125:330227 Hybrid Organic-Inorganic Thermoplastics: Styryl-Based
 Polyhedral Oligomeric Silsesquioxane Polymers. Haddad, Timothy S.;

Lichtenhan, Joseph D. (Phillips Laboratory, Hughes STX Corporation, Edwards AFB, CA, 93524, USA). Macromolecules, 29(22), 7302-7304 (English) 1996. CODEN: MAMOBX. ISSN: 0024-9297. Publisher: American Chemical Society.

AB The synthesis of linear, thermoplastic, hybrid inorg.-org. polymers has been achieved by copolymerizing a preformed, oligomeric inorg. macromer with 4-methylstyrene. Unlike other hybrid materials, networks are not obtained because the inorg. portion of the material is a well-defined **polyhedral oligosilsesquioxane**, $R_7(\text{Si}_8\text{O}_{12})(\text{CH}_2\text{CH}_2\text{C}_6\text{H}_4\text{CH}:\text{CH}_2)$ $R = \text{c-C}_6\text{H}_{11}$ or $\text{c-C}_5\text{H}_9$, which contains only a single polymerizable styrene functionality. A series of copolymers with 4-methylstyrene show a range of glass transitions over greater than 200.degree. C; the more inorg. material present, the higher the glass transition of the copolymer. Inter/intra polymer chain interactions between the inorg. groups would help to retard chain motions and is probably responsible for the large changes in glass transition.

IT 183291-43-2P 183291-44-3P 183291-45-4P

183291-46-5P

(prepn. and characterization and thermal transition of)

RN 183291-43-2 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, 1,3,5,7,9,11,13-heptacyclohexyl-15-[2-(ethenylphenyl)ethyl]-, homopolymer (9CI) (CA INDEX NAME)

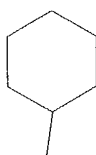
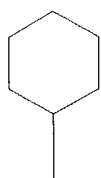
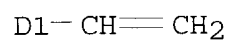
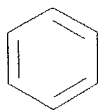
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CRN 183291-41-0

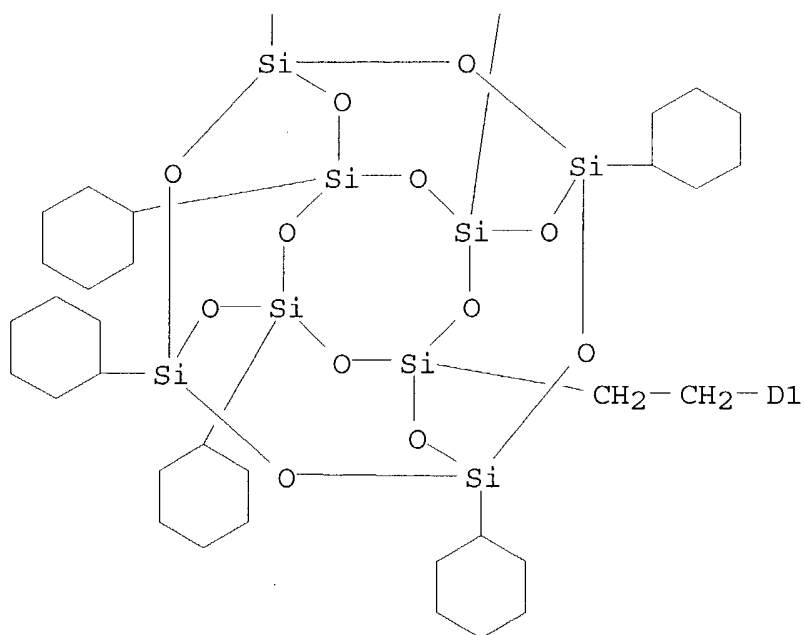
CMF C52 H88 O12 Si8

CCI IDS

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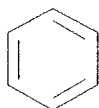


RN 183291-44-3 HCA
 CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, 1,3,5,7,9,11,13-heptacyclopentyl-15-[2-(ethenylphenyl)ethyl]-, homopolymer (9CI)
 (CA INDEX NAME)

CM 1

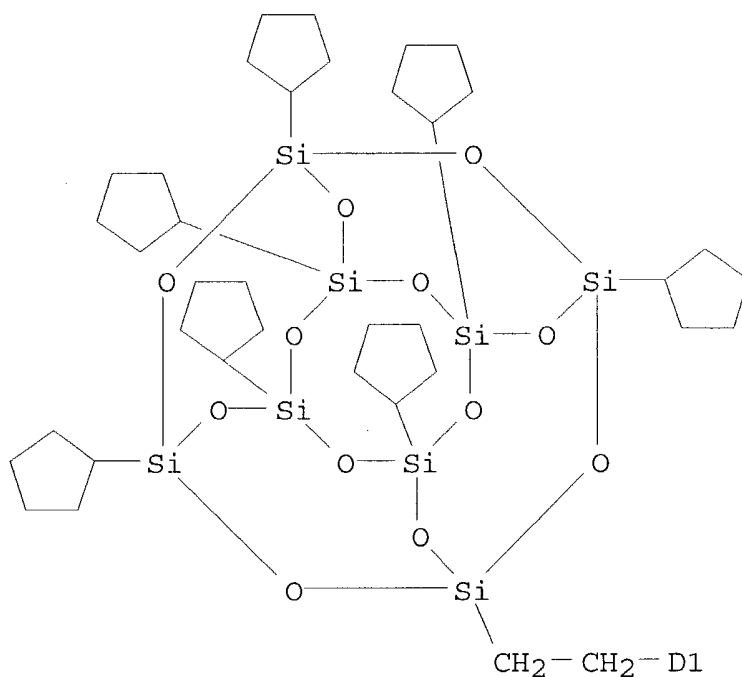
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 CMF C45 H74 O12 Si8
 CCI IDS

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D1-CH=CH₂

PAGE 2-A

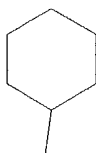
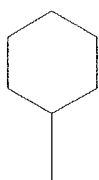
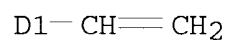
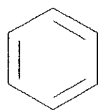


RN 183291-45-4 HCA
CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, 1,3,5,7,9,11,13-heptacyclohexyl-15-[2-(ethenylphenyl)ethyl]-, polymer with 1-ethenyl-4-methylbenzene (9CI) (CA INDEX NAME)

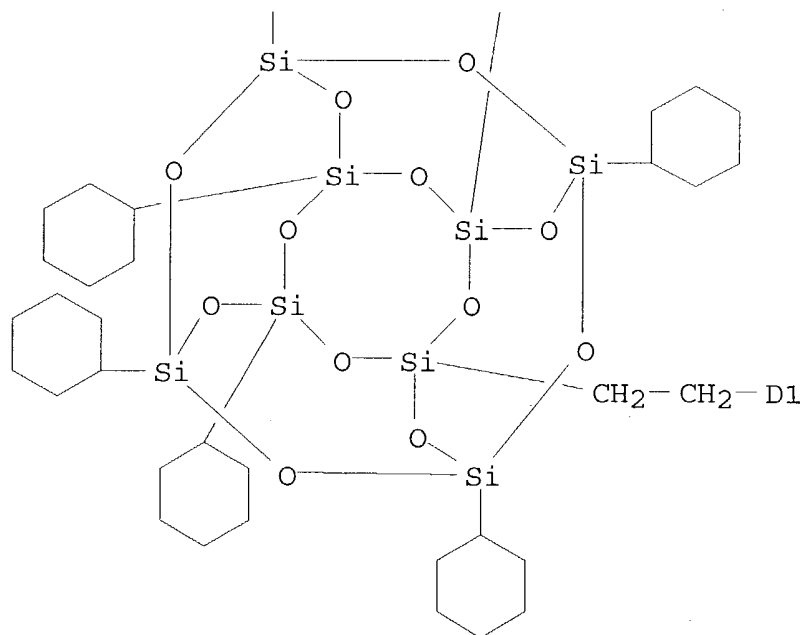
CM 1

CRN 183291-41-0
CMF C52 H88 O12 Si8
CCI IDS

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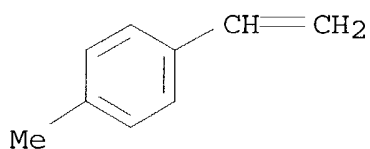
PAGE 2-A



CM 2

CRN 622-97-9

CMF C9 H10



RN 183291-46-5 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, 1,3,5,7,9,11,13-heptacyclopentyl-15-[2-(ethenylphenyl)ethyl]-, polymer with 1-ethenyl-4-methylbenzene (9CI) (CA INDEX NAME)

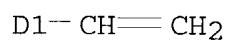
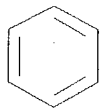
CM 1

CRN 183291-42-1

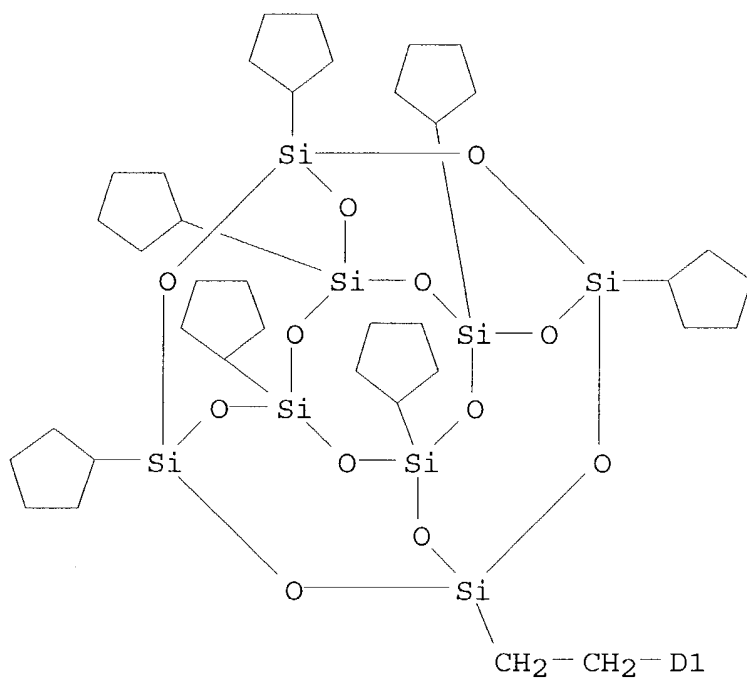
CMF C45 H74 O12 Si8

CCI IDS

PAGE 1-A



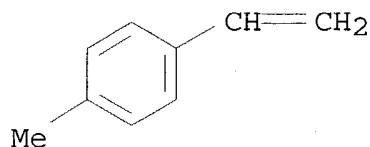
PAGE 2-A



CM 2

CRN 622-97-9

CMF C9 H10



CC 37-3 (Plastics Manufacture and Processing)
 ST silsesquioxane polyhedral oligomer side chain polystyrene; thermal property **oligosilsesquioxane** side chain polystyrene
 IT 4115-83-7 135225-24-0
 (polyhedral **oligosilsesquioxane** prepn.;
 (styrylethyl)trichlorosilane reaction with)
 IT 52783-37-6
 (polyhedral **oligosilsesquioxane** prepn.;
 trisilanol reaction with)
 IT 183291-43-2P 183291-44-3P 183291-45-4P
 183291-46-5P
 (prepn. and characterization and thermal transition of)
 IT 183291-41-0P 183291-42-1P
 (prepn. and polymn. of **polyhedral**
oligosilsesquioxane)

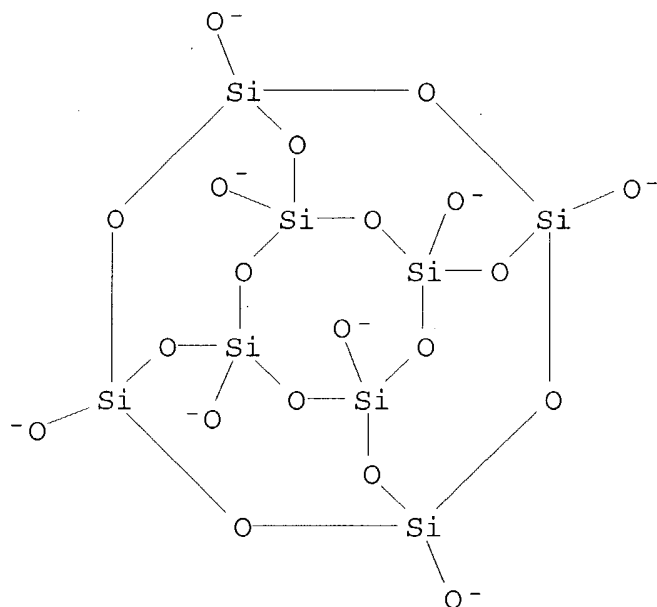
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L46 ANSWER 1 OF 24 HCA COPYRIGHT 2003 ACS on STN
 138:354609 Synthesis and characterization of dendrimers with a **polyhedral oligosilsesquioxane** core. Neumann, Daniel; Matison, Jani G. (Polymer Sci. Group, Ian Wark Res. Inst., Univ. of South Australia, Mawson Lakes, 5095, Australia). Polymeric Materials Science and Engineering, 84, 1025-1026 (English) 2001. CODEN: PMSEGD. ISSN: 0743-0515. Publisher: American Chemical Society.
 AB Octa(hydridodimethylsiloxo)octasilsesquioxane (Q8M8H) has been synthesized in useful yields. The cubic structure of this mol. has eight reactive sites allowing for the attachment of dendrons to the cube to form a dendrimer. A new dendrimer based on this cubic mol. has been produced by modifying an aliph. polyether dendron to include an allyl functionality, which was then attached to the cube via a hydrosilylation reaction. Synthesis and characterization of this novel mol. is described.
 IT 56982-91-3, Octa(tetramethylammonium)silicate
 (synthesis of dendrimers with **polyhedral**
oligosilsesquioxane core)
 RN 56982-91-3 HCA
 CN Methanaminium, N,N,N-trimethyl-, salt with silicic acid (H₈Si₈O₂₀)
 (8:1) (9CI) (CA INDEX NAME)

CM 1

CRN 48219-90-5

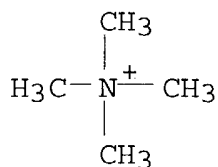
CMF 020 Si8



CM 2

CRN 51-92-3

CMF C4 H12 N

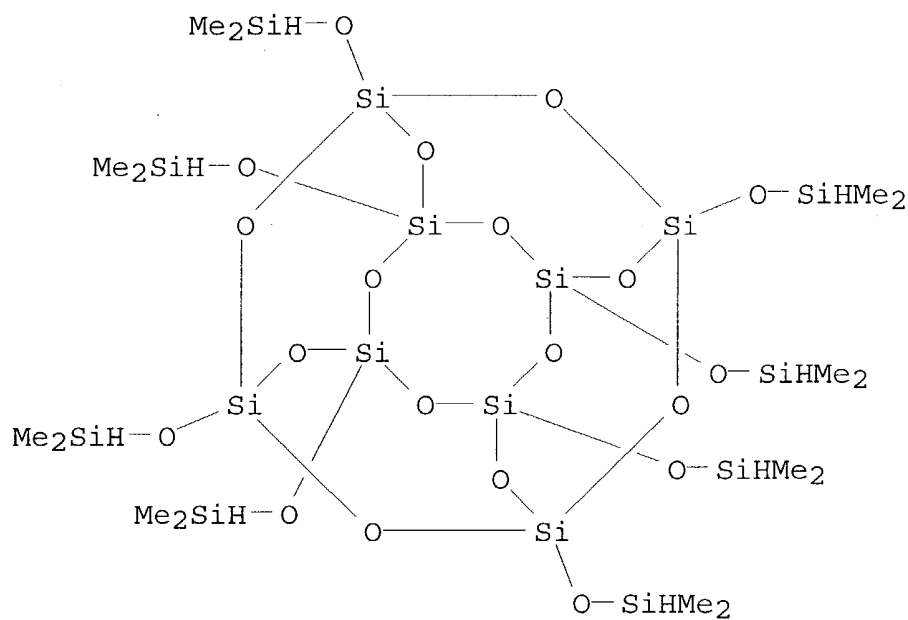


IT 125756-69-6P

(synthesis of dendrimers with **polyhedral
oligosilsesquioxane** core)

RN 125756-69-6 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane,
octakis[(dimethylsilyl)oxy]- (9CI) (CA INDEX NAME)



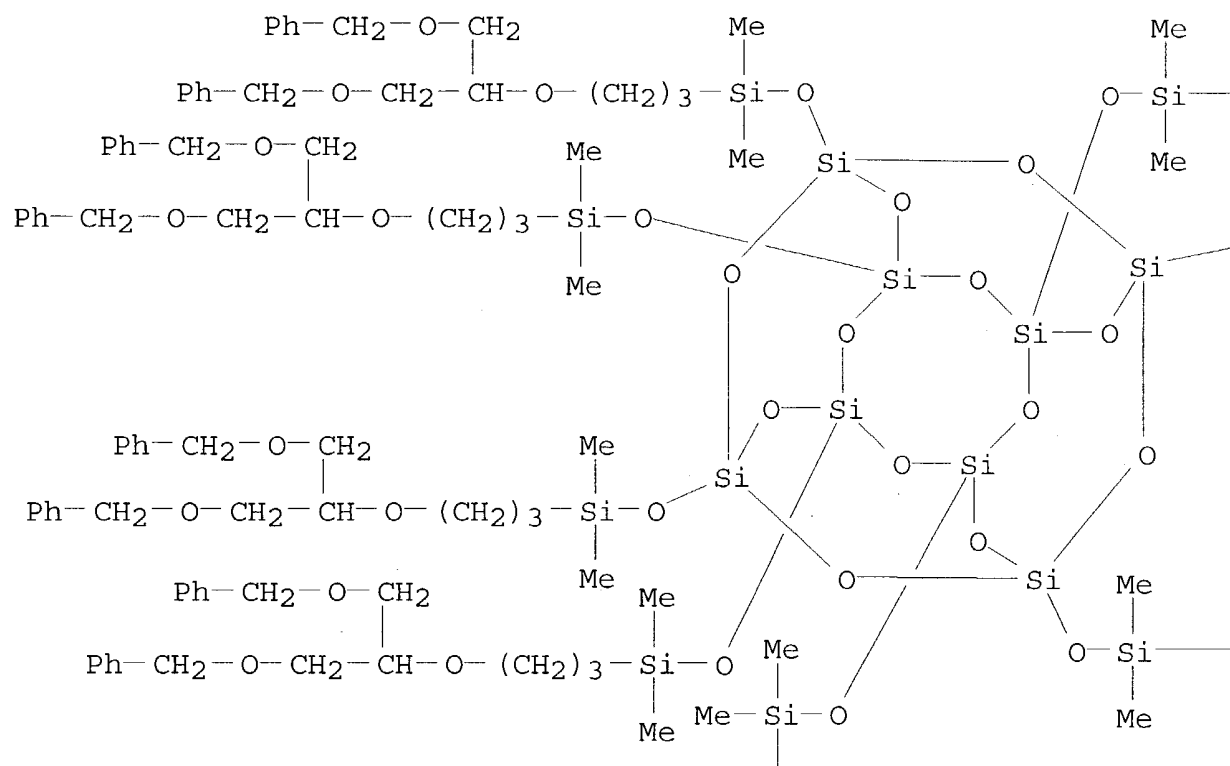
IT 519184-23-7P

(synthesis of dendrimers with **polyhedral
oligosilsesquioxane** core)

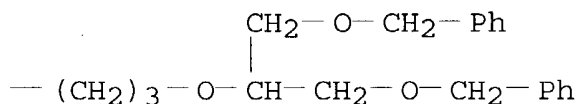
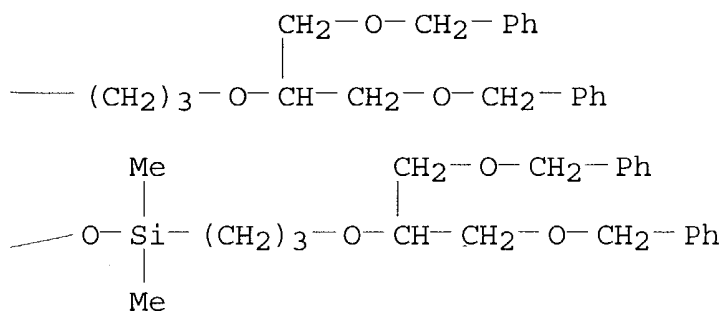
RN 519184-23-7 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octakis[[dimethyl[3-
[2-(phenylmethoxy)-1-[(phenylmethoxy)methyl]ethoxy]propyl]silyl]oxy]-
(9CI) (CA INDEX NAME)

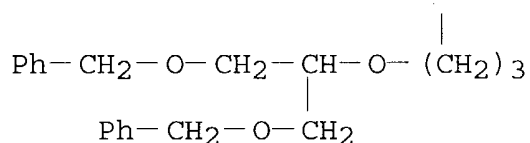
PAGE 1-A



PAGE 1-B



PAGE 2-A



- CC 37-3 (Plastics Manufacture and Processing)
- ST **oligosilsesquioxane** core dendrimer
- IT Polyethers, preparation
(dendrimers; synthesis of dendrimers with **polyhedral**
oligosilsesquioxane core)
- IT Dendritic polymers
(polyethers; synthesis of dendrimers with **polyhedral**
oligosilsesquioxane core)
- IT 106-95-6, Allyl bromide, reactions 1066-35-9, Chlorodimethylsilane
56982-91-3, Octa(tetramethylammonium)silicate
(synthesis of dendrimers with **polyhedral**
oligosilsesquioxane core)
- IT 6972-79-8P 125756-69-6P 519184-22-6P
(synthesis of dendrimers with **polyhedral**
oligosilsesquioxane core)
- IT 519184-23-7P

(synthesis of dendrimers with **polyhedral
oligosilsesquioxane** core)

L46 ANSWER 2 OF 24 HCA COPYRIGHT 2003 ACS on STN

138:25262 Self-assembly of gold nanoparticles through tandem hydrogen bonding and polyoligosilsesquioxane (POSS)-POSS recognition processes. Carroll, Joseph B.; Frankamp, Benjamin L.; Rotello, Vincent M. (Department of Chemistry, The University of Massachusetts, Amherst, MA, 01003, USA). Chemical Communications (Cambridge, United Kingdom) (17), 1892-1893 (English) 2002. CODEN: CHCOFS. ISSN: 1359-7345. Publisher: Royal Society of Chemistry.

AB Diaminopyridine-functionalized polyhedral oligomeric silsesquioxanes (POSS-DAP) self-assemble with complementary thymine-functionalized Au nanoparticles (Thy-Au) into well-defined spherical aggregates, providing highly structured nanocomposites.

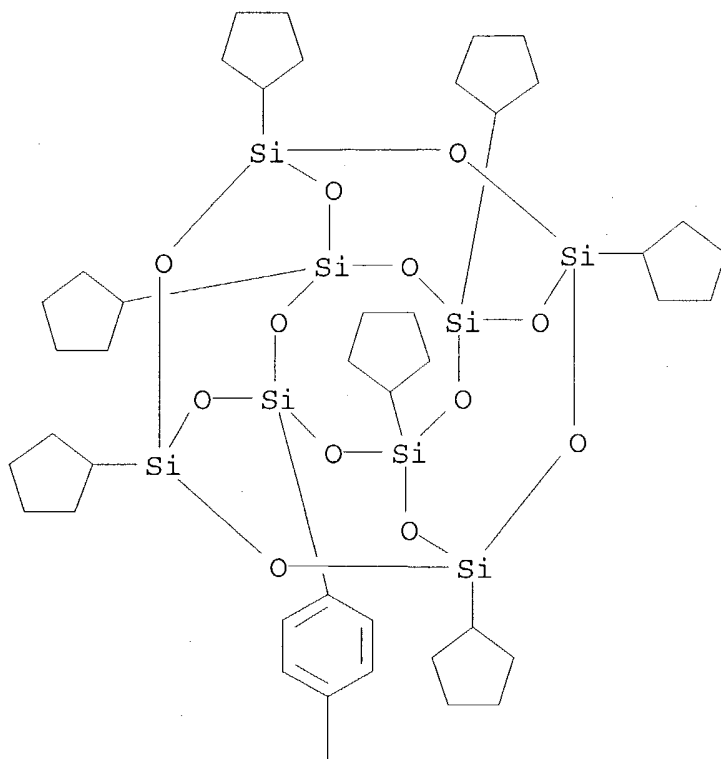
IT 463314-14-9

(hydrogen bond complexes with mercaptodecyl-thymine gold surface compds.; self-assembly of thymine-functionalized gold nanoparticles through hydrogen bonding and diaminopyridine-**oligosilsesquioxane** recognition processes)

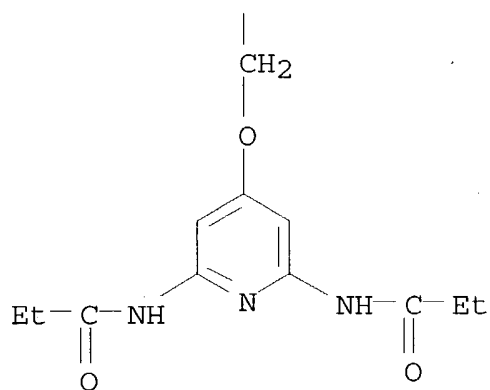
RN 463314-14-9 HCA

CN Propanamide, N,N'-[4-[[4-(heptacyclopentylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)phenyl]methoxy]-2,6-pyridinediyl]bis- (9CI)
(CA INDEX NAME)

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CC 37-5 (Plastics Manufacture and Processing)
 IT Polymer morphology
 (phase; self-assembly of thymine-functionalized gold
 nanoparticles through hydrogen bonding and diaminopyridine-
oligosilsesquioxane recognition processes)

- IT Adsorbed monolayers
Hydrogen bond
Interfacial structure
Nanocomposites
Nanoparticles
Self-assembly
(self-assembly of thymine-functionalized gold nanoparticles through hydrogen bonding and diaminopyridine-**oligosilsesquioxane** recognition processes)
- IT 463314-14-9
(hydrogen bond complexes with mercaptodecyl-thymine gold surface compds.; self-assembly of thymine-functionalized gold nanoparticles through hydrogen bonding and diaminopyridine-**oligosilsesquioxane** recognition processes)
- IT 94805-33-1D, Octanethiol, compds. with gold and thymine
173484-84-9D, 1,10-(Mercaptodecyl)thymine, surface compds. with gold and octanethiol
(hydrogen bond complexes with oligomeric silsesquioxanes; self-assembly of thymine-functionalized gold nanoparticles through hydrogen bonding and diaminopyridine-**oligosilsesquioxane** recognition processes)
- IT 7440-57-5D, Gold, surface-modified with octanethiol-thymine
(self-assembly of thymine-functionalized gold nanoparticles through hydrogen bonding and diaminopyridine-**oligosilsesquioxane** recognition processes)
- IT 278187-19-2D, surface compds. with gold
(surface functionalization of gold nanoparticles and disruption of hydrogen bonding with diaminopyridine-**oligosilsesquioxane** through Me group)
- L46 ANSWER 3 OF 24 HCA COPYRIGHT 2003 ACS on STN
137:384553 Phosphine-containing carbosilane dendrimers based on polyhedral silsesquioxane cores as ligands for hydroformylation reaction of oct-1-ene. Ropartz, Loic; Morris, Russell E.; Foster, Douglas F.; Cole-Hamilton, David J. (School of Chemistry, University of St. Andrews, St. Andrews, Fife, KY16 9ST, UK). Journal of Molecular Catalysis A: Chemical, 182-183, 99-105 (English) 2002. CODEN: JMCCF2. ISSN: 1381-1169. Publisher: Elsevier Science B.V..
- AB Radical addns. of diethyl- and diphenylphosphine have been used to prep. 1st and 2nd generation dendrimers based on **polyhedral oligosilsesquioxane** cores by a divergent synthetic method. The 1st generation dendrimer is built on either 16 and 24 vinyl or allyl arms formed by successive hydrosilation and vinylation or allylation of vinyl-functionalized polyhedral silsesquioxanes. Successive hydrosilation/allylation followed by hydrosilation/vinylation and addn. of phosphine produce the 2nd generation dendrimer. The dendrimers have been used as ligands for the hydroformylation of oct-1-ene catalyzed by [Rh(acac)(CO)₂]. Using the alkyl phosphine-contg. dendrimers as ligands, alcs. (nonan-1-ol and 2-methyloctanol) are obtained, while the diphenylphosphine counterparts lead to the formation of aldehydes (nonan-1-al and 2-methyloctanal). Linear to branched ratios of 3/1

are obtained for the diethylphosphine compds. while ratios of 12 to 14/1 are given by the diphenylphosphine dendritic mols.

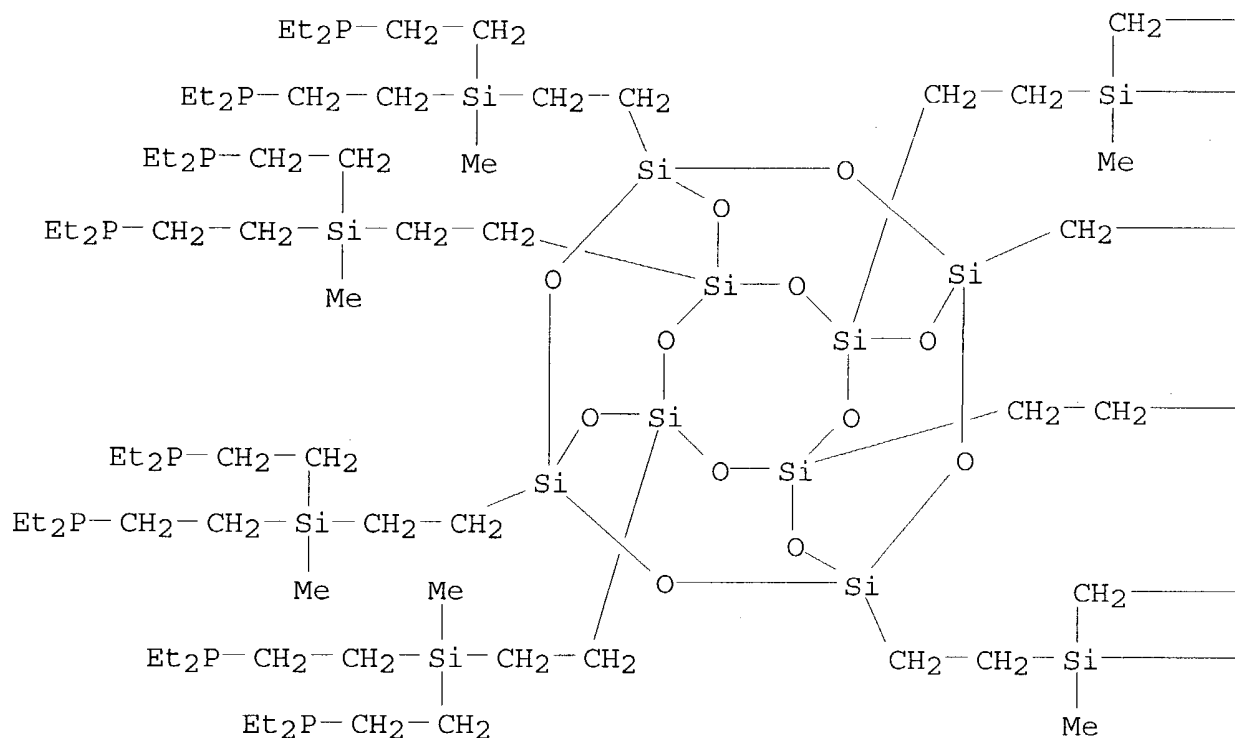
IT 445388-12-5P

(prepn. and performance of phosphine-contg. carbosilane dendrimers based on polyhedral silsesquioxane cores as ligands for hydroformylation reaction of 1-octene in presence of (acetylacetonato)dicarbonylrhodium catalyst)

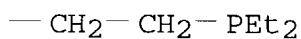
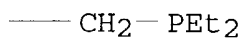
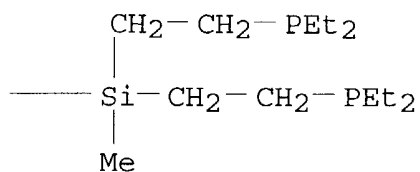
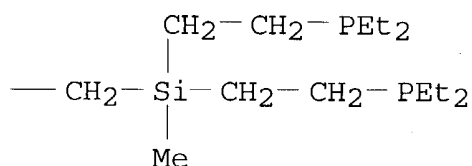
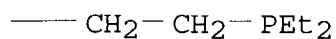
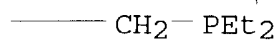
RN 445388-12-5 HCA

CN Phosphine, [pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane-1,3,5,7,9,11,13,15-octayloctakis[2,1-ethanediyl(methylsilylidyne)di-2,1-ethanediyl]]hexadecakis[diethyl- (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 1-B

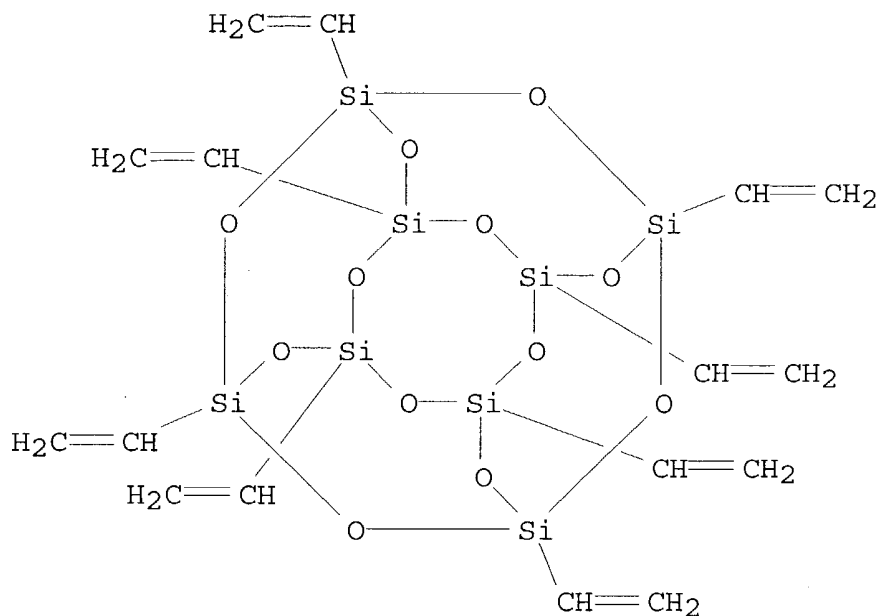


IT 69655-76-1

(prepn. and performance of phosphine-contg. carbosilane
dendrimers based on polyhedral silsesquioxane cores as ligands
for hydroformylation reaction of 1-octene in presence of
(acetylacetonato)dicarbonylrhodium catalyst)

RN 69655-76-1 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octaethenyl- (9CI)
(CA INDEX NAME)



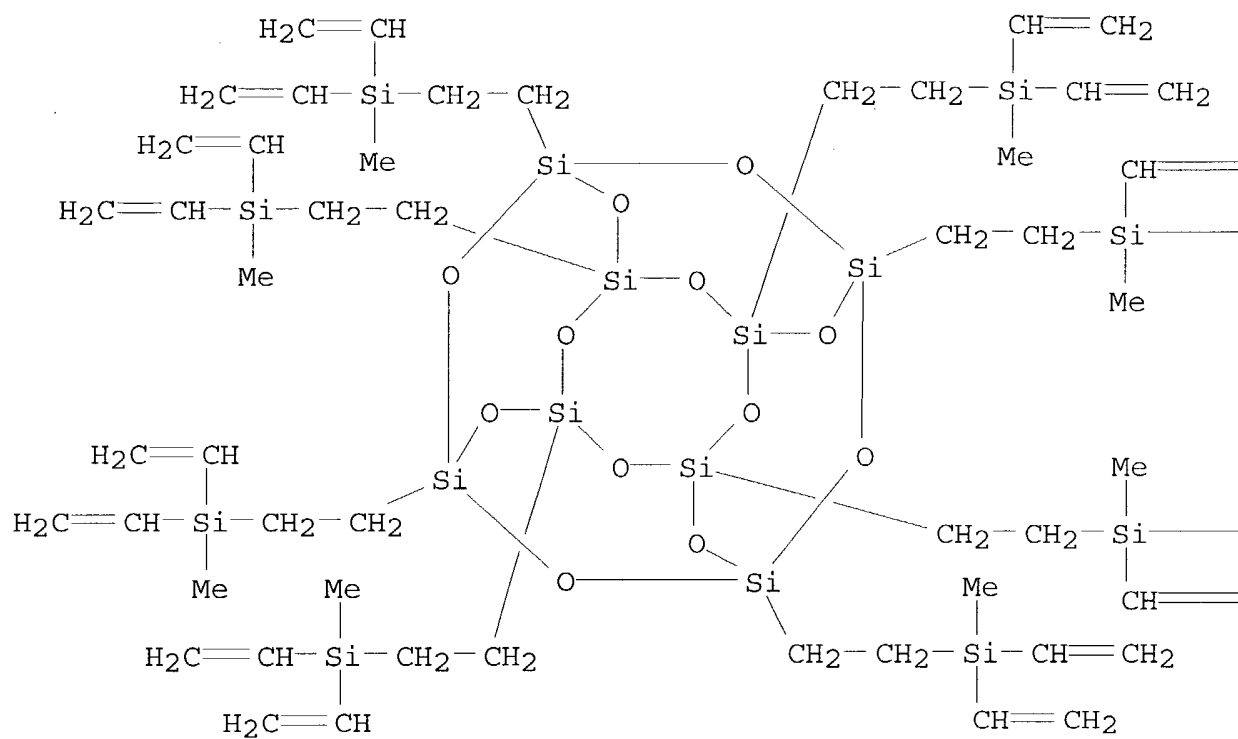
IT 237752-45-3P 400002-79-1P 445388-11-4P
445388-13-6P

(prepn. and performance of phosphine-contg. carbosilane
dendrimers based on polyhedral silsesquioxane cores as ligands
for hydroformylation reaction of 1-octene in presence of
(acetylacetonato)dicarbonylrhodium catalyst)

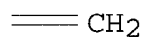
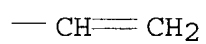
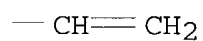
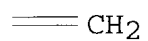
RN 237752-45-3 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octakis[2-
(diethenylmethylsilyl)ethyl]- (9CI) (CA INDEX NAME)

PAGE 1-A



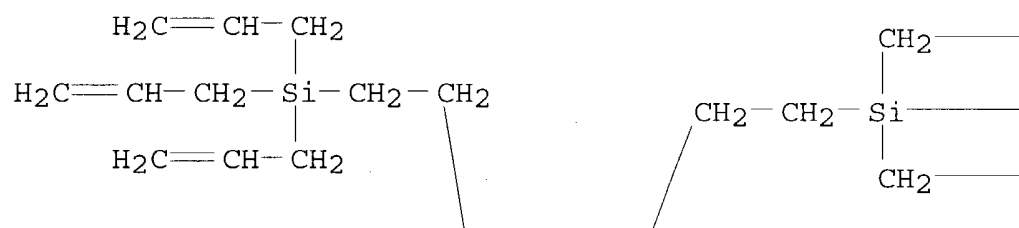
PAGE 1-B



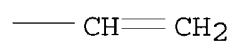
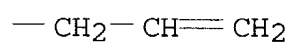
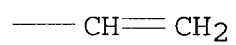
RN 400002-79-1 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octakis[2-(tri-2-propenylsilyl)ethyl]- (9CI) (CA INDEX NAME)

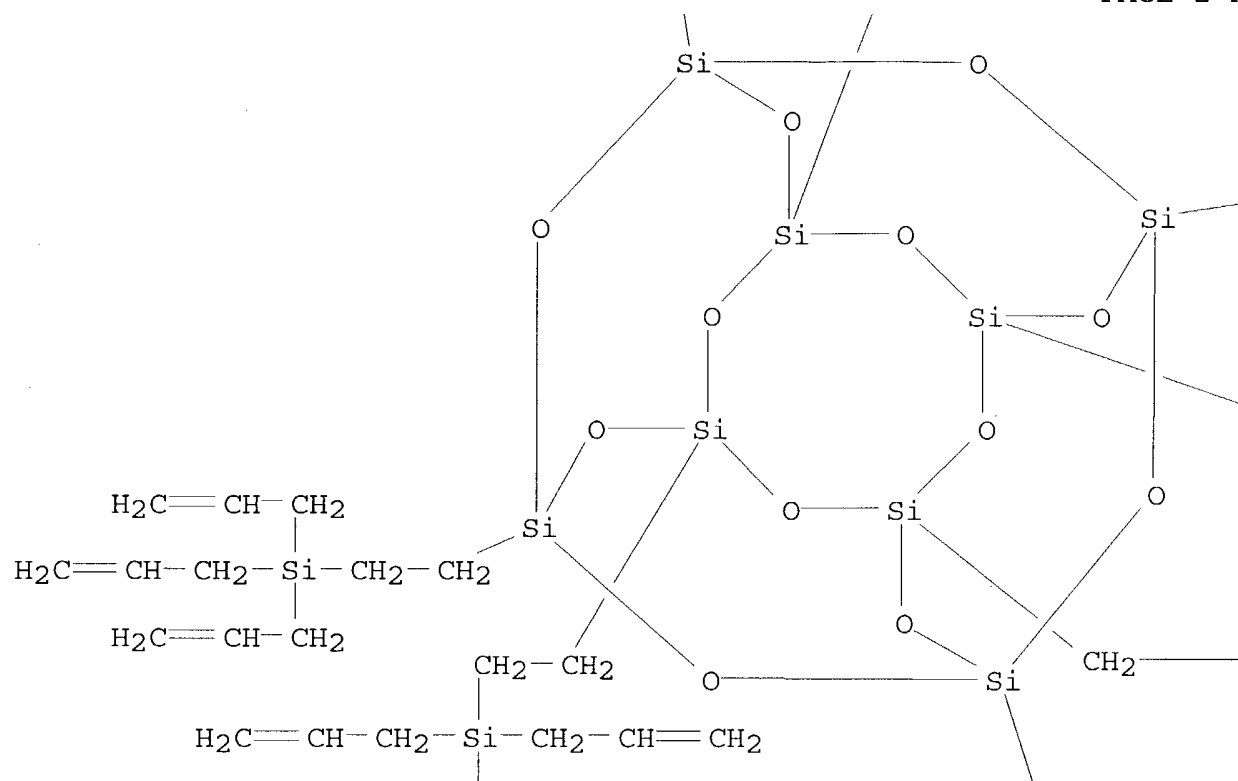
PAGE 1-A



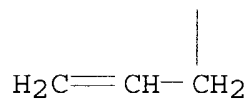
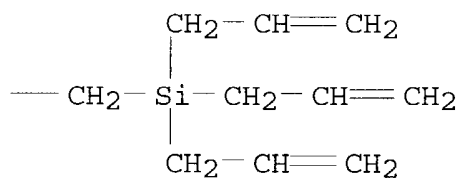
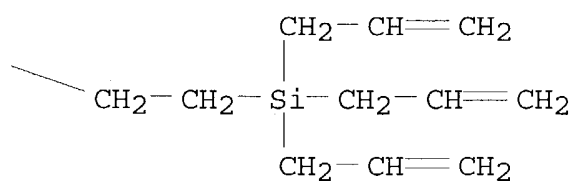
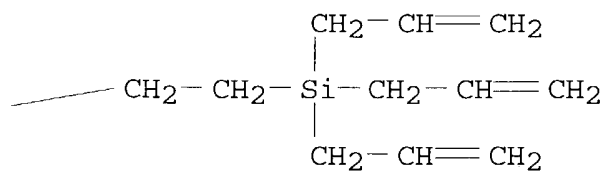
PAGE 1-B



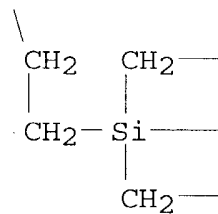
PAGE 2-A



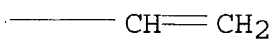
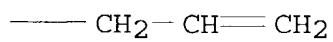
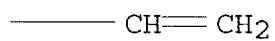
PAGE 2-B



PAGE 3-A



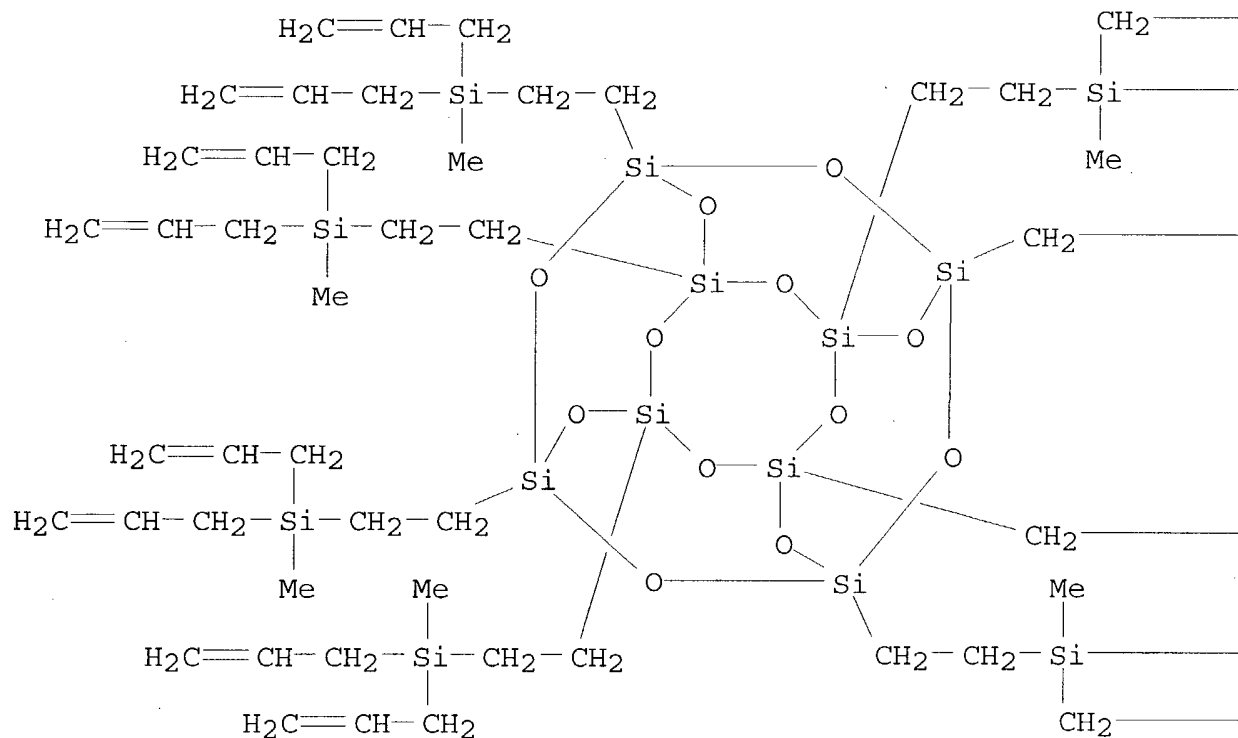
PAGE 3-B



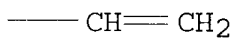
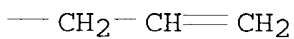
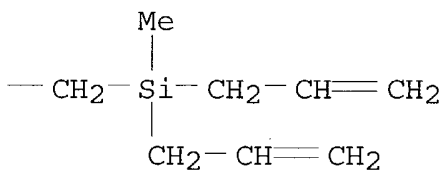
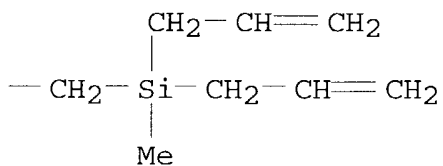
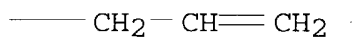
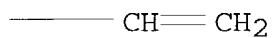
RN 445388-11-4 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octakis[2-(methyldi-2-propenylsilyl)ethyl]- (9CI) (CA INDEX NAME)

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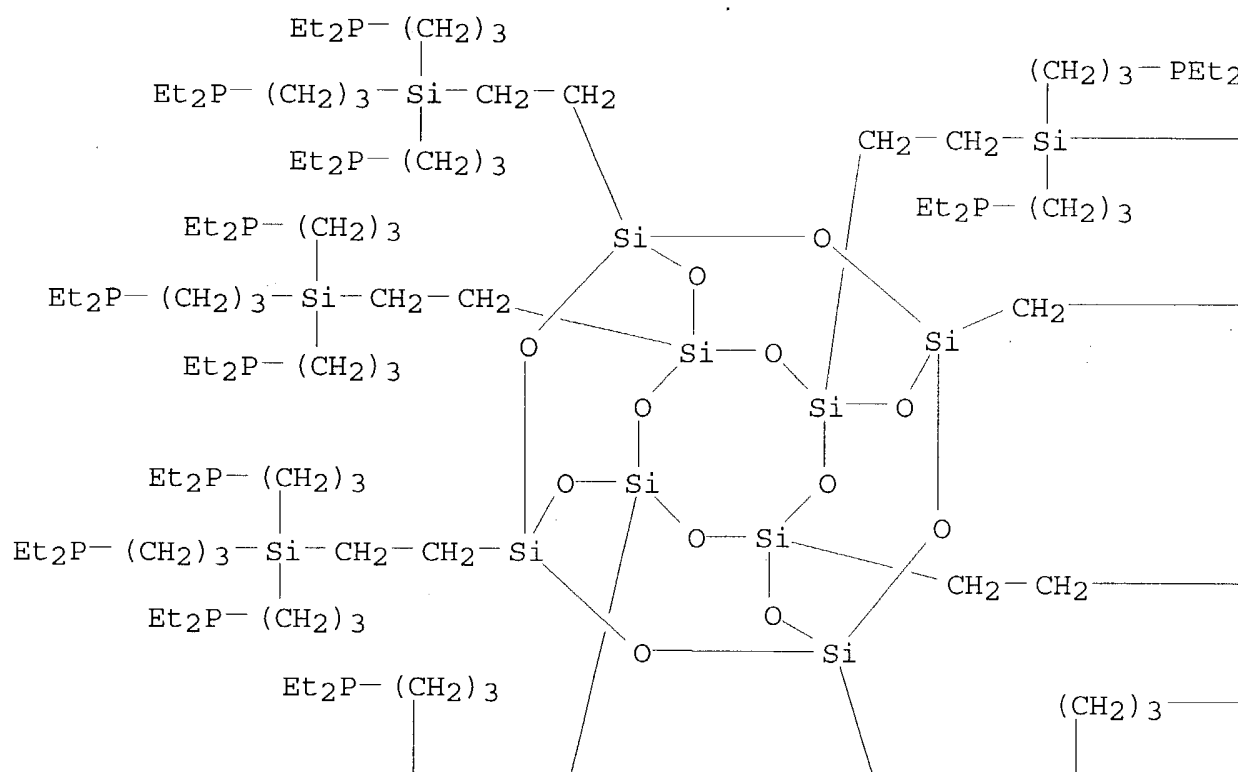
PAGE 1-B



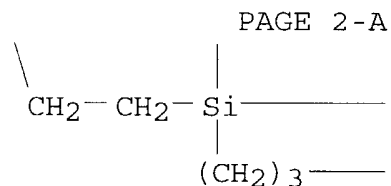
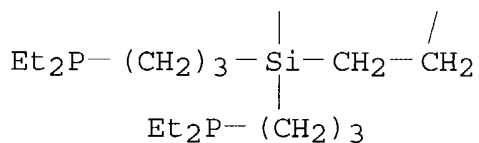
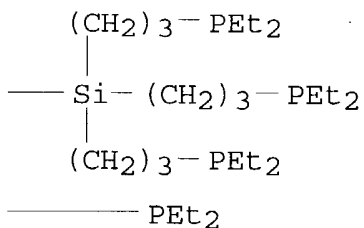
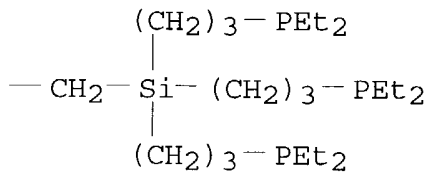
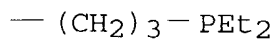
RN 445388-13-6 HCA

CN Phosphine, [pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane-1,3,5,7,9,11,13,15-octayloctakis(2,1-ethanediylsilanetetrayltri-3,1-propanediyl)]tetracosakis[diethyl- (9CI) (CA INDEX NAME)

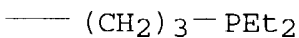
PAGE 1-A



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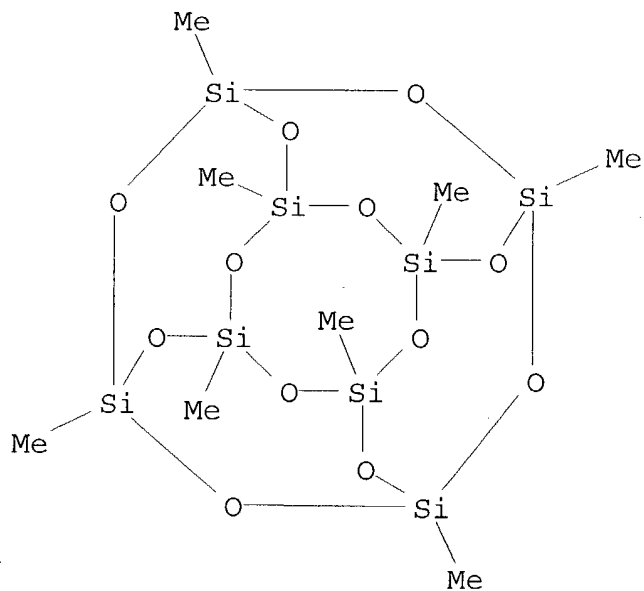
CC 23-1 (Aliphatic Compounds)

Section cross-reference(s): 35, 67

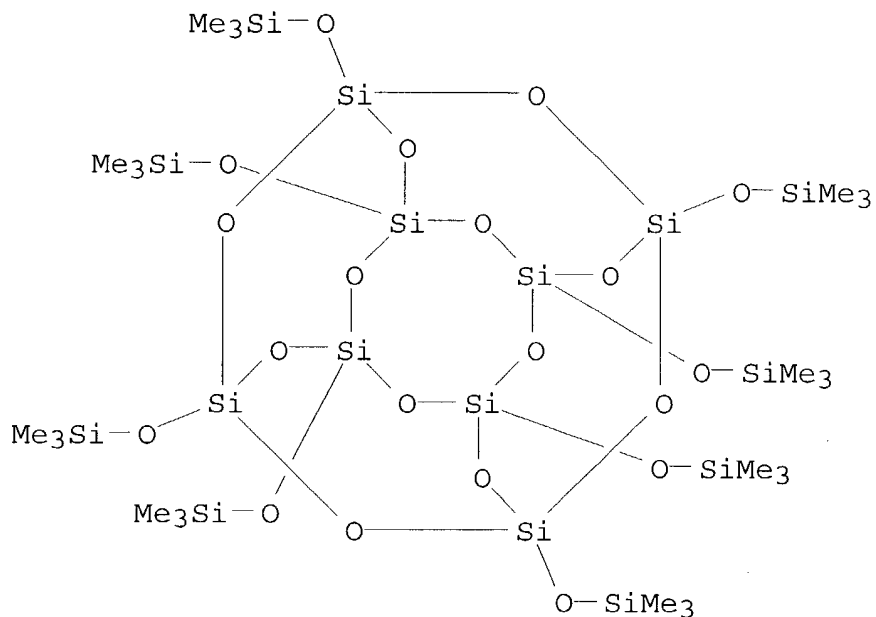
IT 445388-12-5P 475984-61-3P 475984-93-1P

(prepn. and performance of phosphine-contg. carbosilane
dendrimers based on polyhedral silsesquioxane cores as ligands

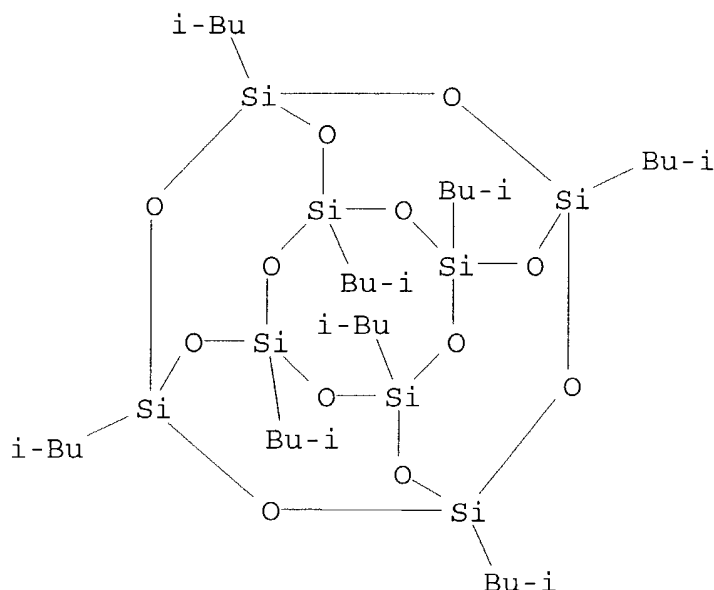
- for hydroformylation reaction of 1-octene in presence of (acetylacetonato)dicarbonylrhodium catalyst)
- IT 75-54-7, Dichloromethylsilane 111-66-0, Oct-1-ene 10025-78-2, Trichlorosilane **69655-76-1**
(prepn. and performance of phosphine-contg. carbosilane dendrimers based on polyhedral silsesquioxane cores as ligands for hydroformylation reaction of 1-octene in presence of (acetylacetonato)dicarbonylrhodium catalyst)
- IT **237752-45-3P 400002-79-1P 445388-11-4P 445388-13-6P** 446034-07-7P 475984-34-0P
(prepn. and performance of phosphine-contg. carbosilane dendrimers based on polyhedral silsesquioxane cores as ligands for hydroformylation reaction of 1-octene in presence of (acetylacetonato)dicarbonylrhodium catalyst)
- L46 ANSWER 4 OF 24 HCA COPYRIGHT 2003 ACS on STN
- 137:338657 Polyhedral oligomeric silsesquioxanes (POSS), their polycarbonate compositions with improved fluidity and flame retardancy, and molded products thereof. Saito, Hideo; Ikeda, Masanori (Asahi Kasei Corporation, Japan). Jpn. Kokai Tokkyo Koho JP 2002327062 A2 20021115, 13 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-133313 20010427.
- AB The silsesquioxanes (POSS) contain 10 ppb-100 ppm alkali metals, alk. earth metals, and/or N and are represented by $[\text{RSiO}_3/2]_n$ and/or $(\text{RSiO}_3/2)_n\text{-m}(\text{O}_1/2\text{H})_{2+\text{m}}$ ($\text{R} = \text{H}$, C1-20 satd. hydrocarbyl, C2-20 alkenyl, C7-20 aralkyl, C6-20 aryl, Si-bearing group of Si no. 1-10; $n = 6-14$; $m = 0, 1$),. The compns., showing superior fluidity and flame retardancy, contain (0.1-50%) the POSS. Thus, a 90:10 (%) mixt. of Iupilon S 3000 (bisphenol A polycarbonate) and octaisobutyloctasilsesquioxane $[[\text{K}^+] 50 \text{ ppm}]$ was kneaded at 280.degree. to show no degrdn. of polycarbonate and MFR 19 g/10 min and was injection molded to give a specimen showing burning time 2.5 s as av. and 5 s as the max. and no dripping in UL 94 fire resistance test.
- IT **17865-85-9 51777-38-9 221326-46-1**
(fireproofing agents; polycarbonate compns. contg. **polyhedral oligosilsesquioxanes** (POSS) and showing high flame retardancy and fluidity)
- RN 17865-85-9 HCA
- CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octamethyl- (7CI, 9CI) (CA INDEX NAME)



RN 51777-38-9 HCA
 CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane,
 octakis[(trimethylsilyl)oxy]- (9CI) (CA INDEX NAME)



RN 221326-46-1 HCA
 CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octakis(2-
 methylpropyl)- (9CI) (CA INDEX NAME)



- IC ICM C08G077-14
ICS C08J005-00; C08K003-00; C08L069-00; C08L083-04
CC 37-6 (Plastics Manufacture and Processing)
Section cross-reference(s): 38
IT Silsesquioxanes
(phenethyl, polyhedral, fireproofing agents; polycarbonate compns. contg. **polyhedral oligosilsesquioxanes** (POSS) and showing high flame retardancy and fluidity)
IT Fireproofing agents
(polycarbonate compns. contg. **polyhedral oligosilsesquioxanes** (POSS) and showing high flame retardancy and fluidity)
IT Molded plastics, properties
(polycarbonate compns. contg. **polyhedral oligosilsesquioxanes** (POSS) and showing high flame retardancy and fluidity)
IT 17865-85-9 51777-38-9 221326-46-1
307531-92-6
(fireproofing agents; polycarbonate compns. contg. **polyhedral oligosilsesquioxanes** (POSS) and showing high flame retardancy and fluidity)
IT 7440-09-7, Potassium, properties 7727-37-9, Nitrogen, properties
(polycarbonate compns. contg. **polyhedral oligosilsesquioxanes** (POSS) and showing high flame retardancy and fluidity)
IT 24936-68-3, Lupilon S 3000, properties 25037-45-0
(polycarbonate compns. contg. **polyhedral oligosilsesquioxanes** (POSS) and showing high flame retardancy and fluidity)

137:156345 Chitosan-oligo(silsesquioxane) blend
membranes: Preparation, morphology, and diffusion permeability.
Strachota, Adam; Tishchenko, Galina; Matejka, Libor; Bleha, Miroslav
(Institute of Macromolecular Chemistry, Academy of Sciences of the
Czech Republic, Prague, 16206/6, Czech Rep.). Journal of Inorganic
and Organometallic Polymers, Volume Date 2001, 11(3), 165-182
(English) 2002. CODEN: JIOPE4. ISSN: 1053-0495. Publisher: Kluwer
Academic/Plenum Publishers.

AB Prepn. of the blend chitosan (CHI) membranes contg. polyhedral
oligomeric silsesquioxane (POSS) derivs. was investigated. POSS
derivs. such as (3-aminopropyl)isobutyl-POSS (amino-POSS),
[2-(3,4-epoxycyclohexyl) ethyl]isobutyl-POSS (epoxy-POSS), and
octa(tetramethylammonium)-POSS were used. The blend CHI-amino-POSS
membranes were predicted to be the most porous due to having the
weakest interactions between the components in the blends. The
CHI-epoxy-POSS blend membranes were assumed to be more dense owing
to chem. binding of the chitosan amino groups with the epoxy groups
of POSS. Studies of membrane morphol. and diffusion permeability
support these predictions.

IT 56982-91-3 444315-15-5 445379-56-6
(prepn., morphol., and diffusion permeability of
chitosan-polyhedral oligomeric silsesquioxane deriv. blend
membranes)

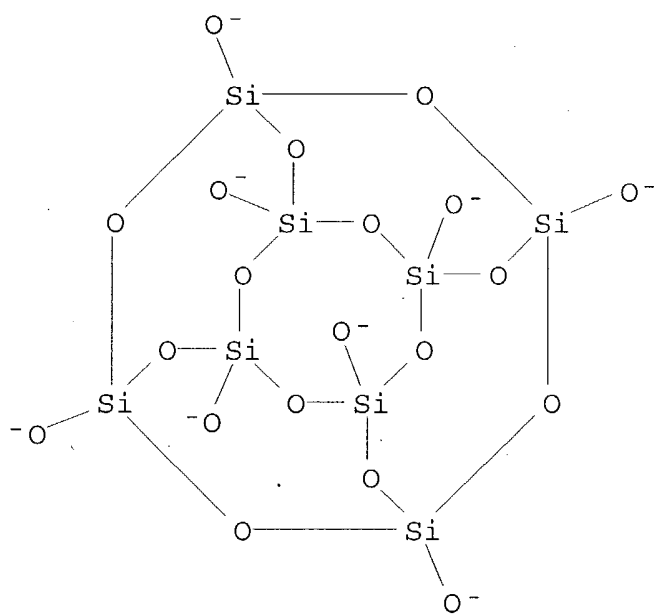
RN 56982-91-3 HCA

CN Methanaminium, N,N,N-trimethyl-, salt with silicic acid (H8Si8O20)
(8:1) (9CI) (CA INDEX NAME)

CM 1

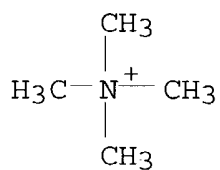
CRN 48219-90-5

CMF O20 Si8

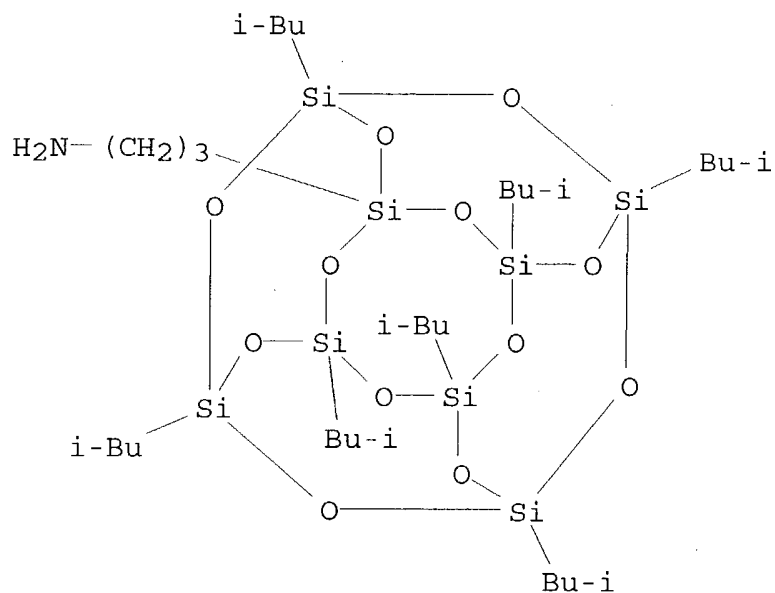


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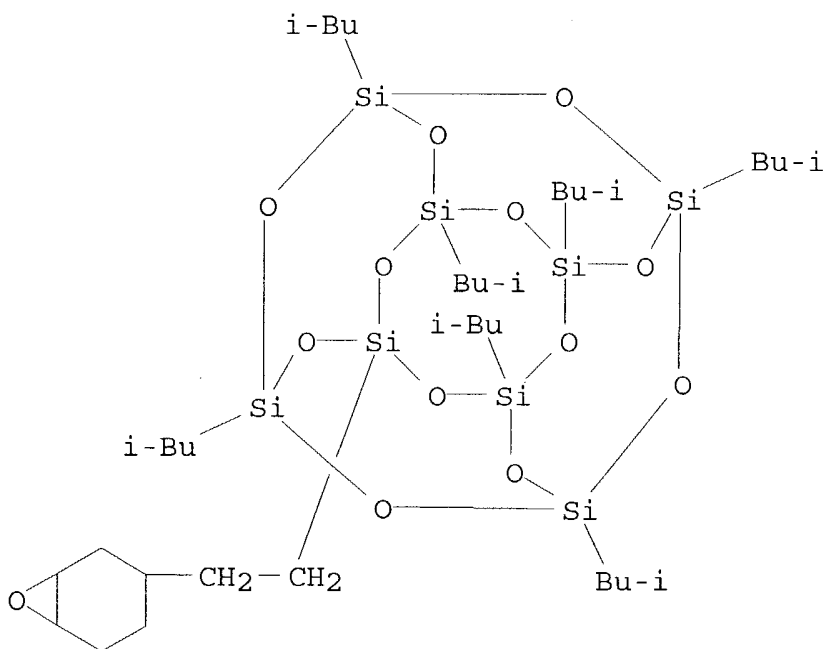
CRN 51-92-3
CMF C4 H12 N



RN 444315-15-5 HCA
CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanepropanamine,
3,5,7,9,11,13,15-heptakis(1-methylethyl) - (9CI) (CA INDEX NAME)



RN 445379-56-6 HCA
 CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, heptakis(2-methylpropyl)[2-(7-oxabicyclo[4.1.0]hept-3-yl)ethyl]- (9CI) (CA INDEX NAME)



CC 44-5 (Industrial Carbohydrates)
 ST chitosan **polyhedral oligosilsesquioxane** blend

membrane; diffusion chitosan **polyhedral oligosilsesquioxane** blend membrane; permeability chitosan **polyhedral oligosilsesquioxane** blend membrane; morphol chitosan **polyhedral oligosilsesquioxane** blend membrane

IT 9012-76-4, Chitosan 56982-91-3 444315-15-5
445379-56-6
(prepn., morphol., and diffusion permeability of
chitosan-polyhedral oligomeric silsesquioxane deriv. blend
membranes)

L46 ANSWER 6 OF 24 HCA COPYRIGHT 2003 ACS on STN

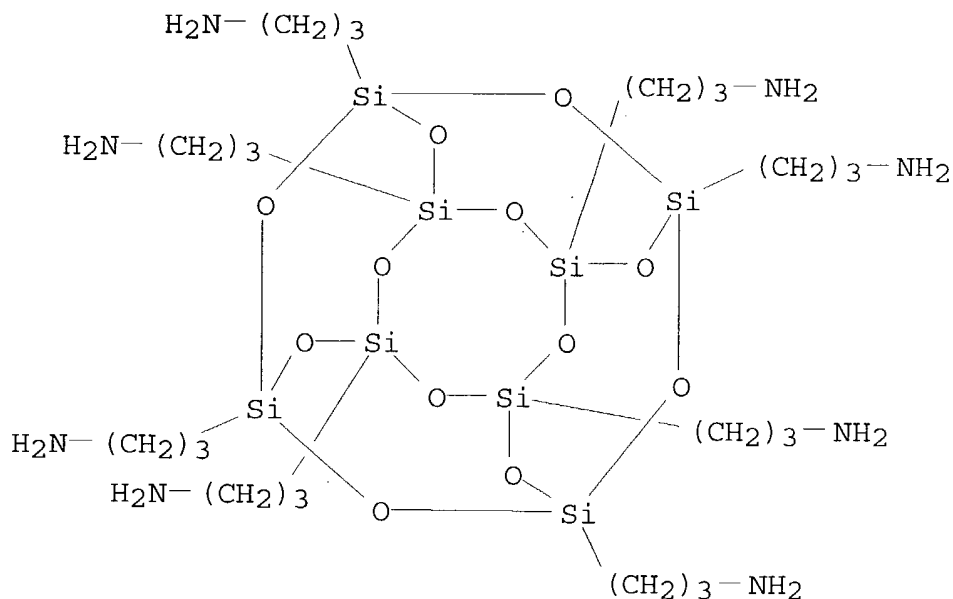
137:155719 **Oligosilsesquioxanes** as Versatile Building Blocks
for the Preparation of Self-Assembled Thin Films. Cassagneau,
Thierry; Caruso, Frank (Max Planck Institute of Colloids and
Interfaces, Potsdam, D-14424, Germany). Journal of the American
Chemical Society, 124(27), 8172-8180 (English) 2002. CODEN: JACSAT.
ISSN: 0002-7863. Publisher: American Chemical Society.

AB A self-assembly approach to the prepn. of nanocomposite siliceous
thin films by using **oligosilsesquioxanes** as building
blocks is presented. Poly(styrene-4-sulfonate), PSS, and
octakis(3-aminopropyl)silsesquioxane, NSi8, were layer-by-layer
(LbL) assembled onto planar substrates and polystyrene (PS)
particles, thus forming composite multilayers. We have clarified
the binding properties of NSi8 to PSS by examg. the pH influence on
film buildup by microelectrophoresis (.zeta.-potential) and quartz
crystal microgravimetry (QCM). The regular growth of PSS/NSi8
multilayers on planar supports was confirmed by surface plasmon
resonance (SPR) spectroscopy and QCM. By applying the LbL coating
procedure to spherical templates, we prepd. compact, microporous
hollow silica spheres by calcining PS spheres coated with
(poly(allylamine hydrochloride) (PAH)/PSS)2/(NSi8/PSS)n (n varying
from 3 to 12), at 750 .degree.C, because of sintering of the
octameric clusters (NSi8). Hollow spheres derived from coatings
with n = 3 drastically altered in size (relative to the template
core), depending on the size of the PS particles used. The novelty
of this method for the nanofabrication of siliceous films stems from
the use of well-defined and discrete building blocks, such as NSi8,
leading to homogeneous org.-silica composite films as well as
individual siliceous particles of variable size and shape.

IT 150380-11-3
(self-assembly of octakis(aminopropyl)silsesquioxane in
alternation with poly(styrenesulfonate) to form thin films on
planar and spherical supports)

RN 150380-11-3 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxaneoctapropanamine (9CI)
(CA INDEX NAME)



CC 38-3 (Plastics Fabrication and Uses)

Section cross-reference(s): 37

ST **oligosilsesquioxane** self assembly polystyrenesulfonate thin film; silica nanocomposite self assembly **oligosilsesquioxane** polystyrene particle

IT 9003-53-6D, Polystyrene, sulfonated 25704-18-1, Poly(sodium 4-styrenesulfonate) 26062-79-3, Poly(diallyldimethylammonium chloride) 71550-12-4, Poly(allylamine hydrochloride) 150380-11-3

(self-assembly of octakis(aminopropyl)silsesquioxane in alternation with poly(styrenesulfonate) to form thin films on planar and spherical supports)

L46 ANSWER 7 OF 24 HCA COPYRIGHT 2003 ACS on STN

137:155695 Hydrocarbonylation reactions using alkylphosphine-containing dendrimers based on a **polyhedral**

oligosilsesquioxane core. Ropartz, Loic; Foster, Douglas F.; Morris, Russell E.; Slawin, Alexandra M. Z.; Cole-Hamilton, David J. (School of Chemistry, University of St. Andrews, St. Andrews, KY16 9ST, UK). Journal of the Chemical Society, Dalton Transactions (9), 1997-2008 (English) 2002. CODEN: JCSDAA. ISSN: 1472-7773. Publisher: Royal Society of Chemistry.

AB Radical addns. of HPR2 (R = Et, Cy) onto alkenyl groups or nucleophilic substitution reactions on chlorosilanes by LiCH2PR2 (R = Me, Hex) are used to prep. first and second-generation alkylphosphine-contg. dendrimers based on a polyhedral oligomeric silsesquioxane (POSS) core. The first generation dendrimers (G1) are built on 16 or 24 arms, which are chlorides, vinyl groups or allyl moieties. Hydrosilylation (chlorosilane) followed by vinylation or allylation of octavinyl-functionalized POSS gave these

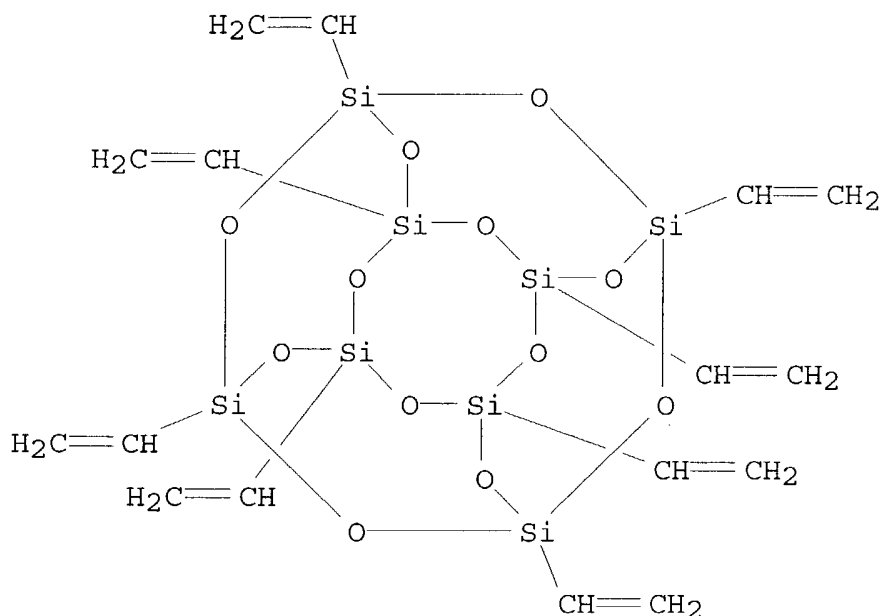
G1 dendrimers. Successive hydrosilylation/allylation followed by hydrosilylation/vinylation produce the framework for the second-generation dendrimer (G2). The phosphorus-contg. dendrimers are used as ligands for the hydrocarbonylation of alkenes (hex-1-ene, oct-1-ene, non-1-ene, prop-1-en-2-ol) in polar solvents (ethanol or THF) using the complexes $[\text{Rh}(\text{acac})(\text{CO})_2]$ or $[\text{Rh}_2(\text{O}_2\text{CMe})_4]$ as metal source. Linear to branched ratios up to 3 : 1 for the alc. products are obtained for the diethylphosphine dendrimers. The reactions were found to proceed mainly via the formation of the corresponding aldehydes.

IT 69655-76-1

(core; prepn. of alkylphosphine-contg. **polyhedral oligosilsesquioxane**-based dendrimers as ligands for rhodium catalysts and their application in hydrocarbonylation of alkenes)

RN 69655-76-1 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octaethenyl- (9CI)
(CA INDEX NAME)



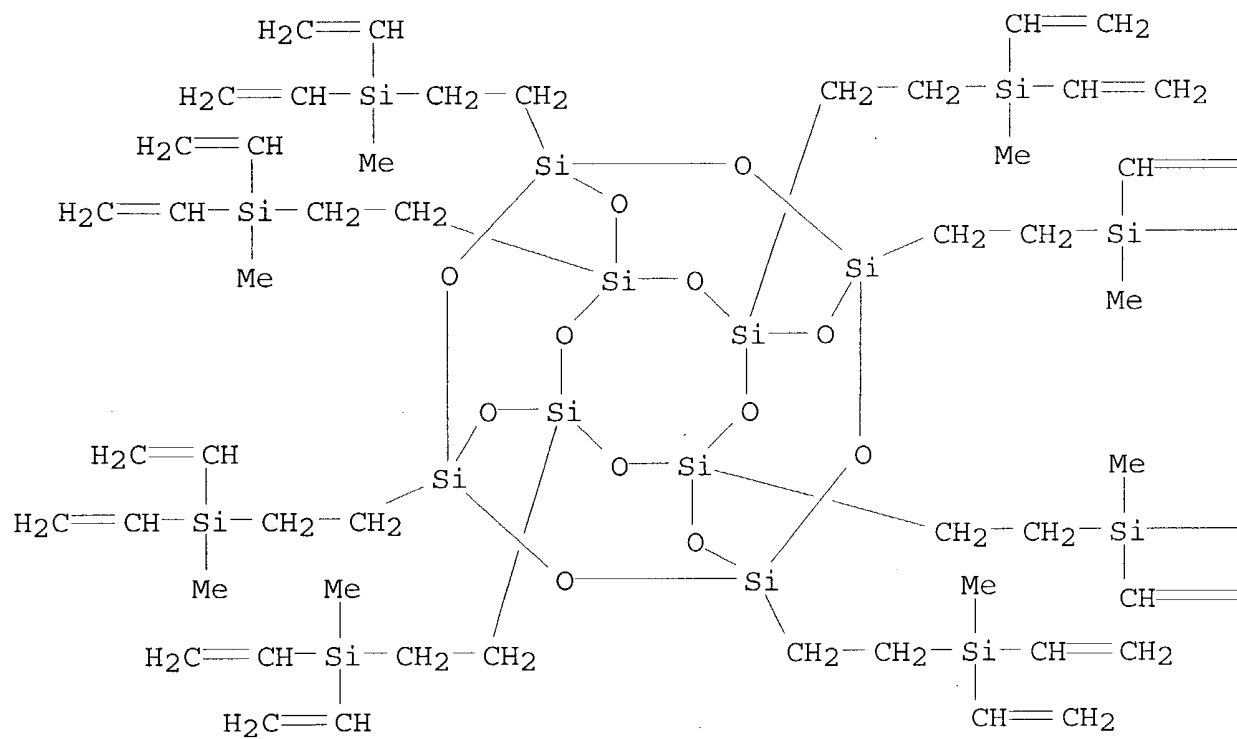
IT 237752-45-3P 400002-79-1P 445388-11-4P

(in reaction with alkylphosphines; prepn. of alkylphosphine-contg. **polyhedral oligosilsesquioxane**-based dendrimers as ligands for rhodium catalysts and their application in hydrocarbonylation of alkenes)

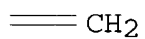
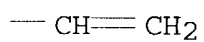
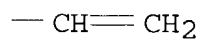
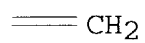
RN 237752-45-3 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octakis[2-(diethenylmethylsilyl)ethyl]- (9CI) (CA INDEX NAME)

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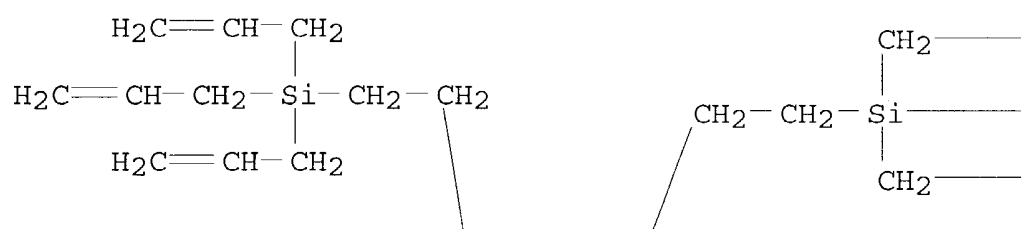
PAGE 1-B



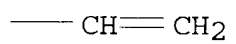
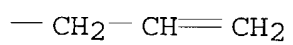
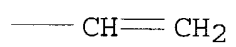
RN 400002-79-1 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octakis[2-(tri-2-propenylsilyl)ethyl]- (9CI) (CA INDEX NAME)

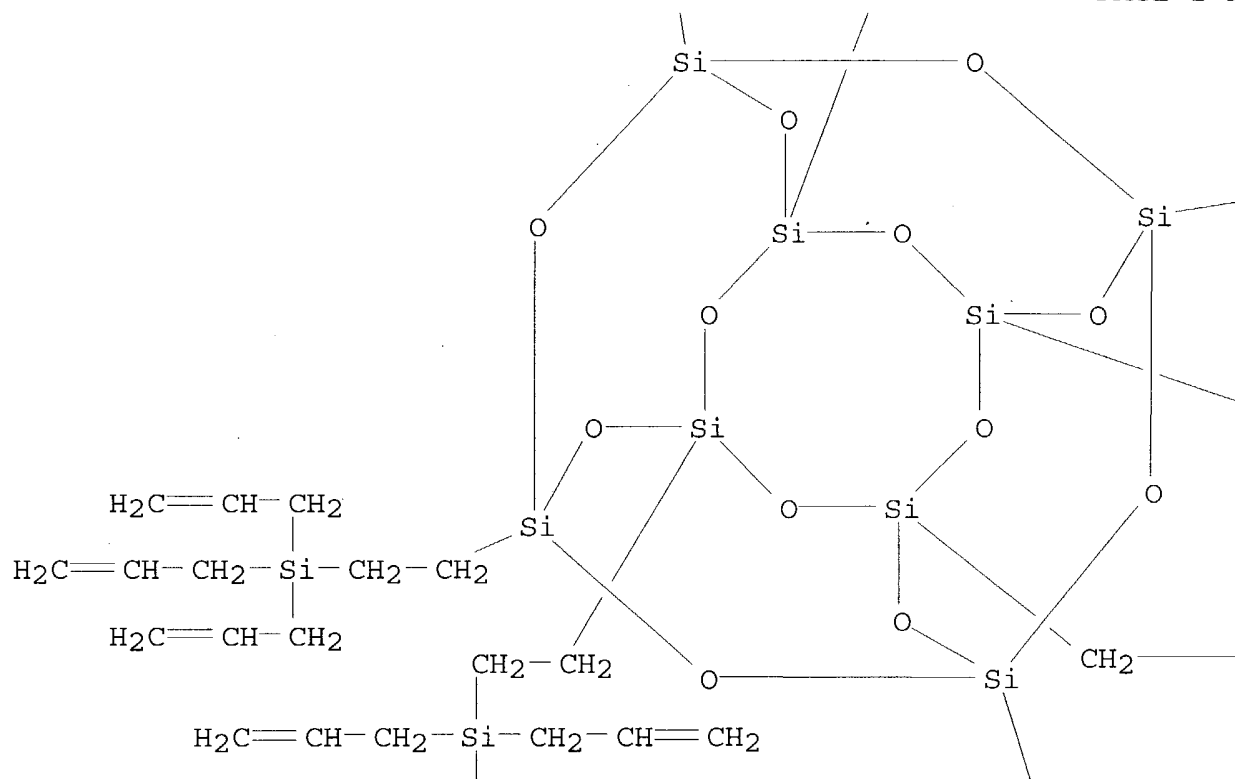
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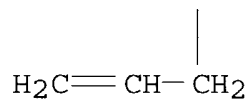
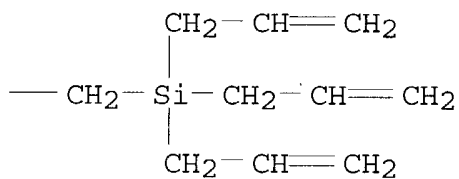
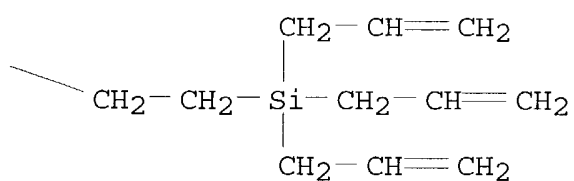
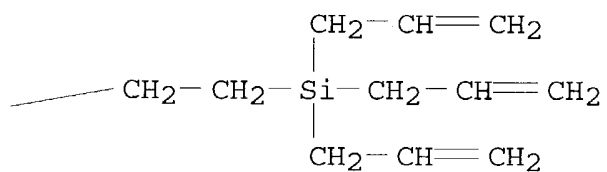
PAGE 1-B



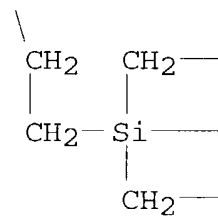
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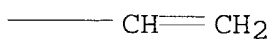
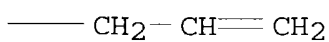
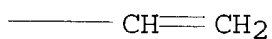
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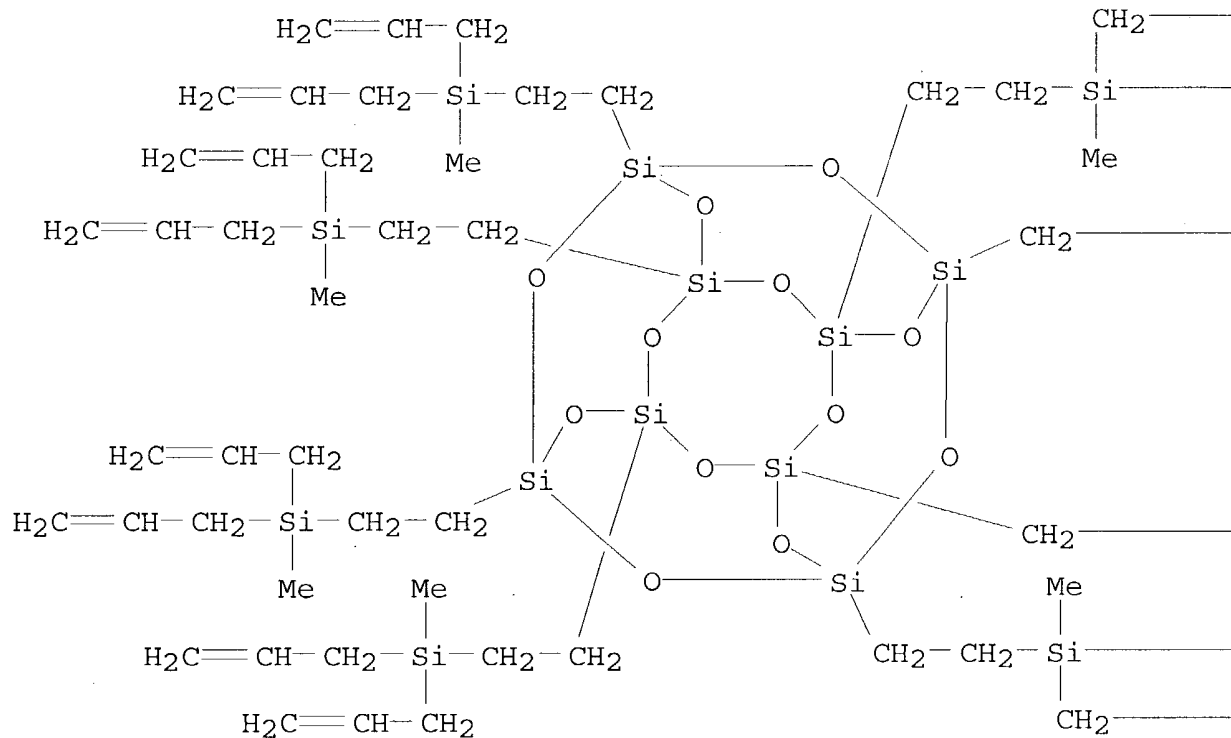
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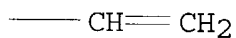
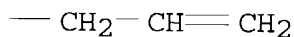
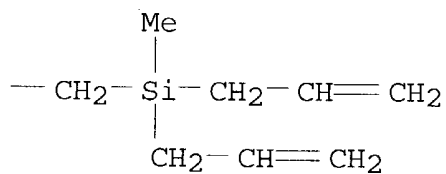
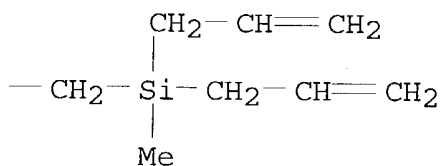
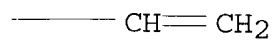
RN 445388-11-4 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octakis[2-(methyldi-2-propenylsilyl)ethyl]- (9CI) (CA INDEX NAME)

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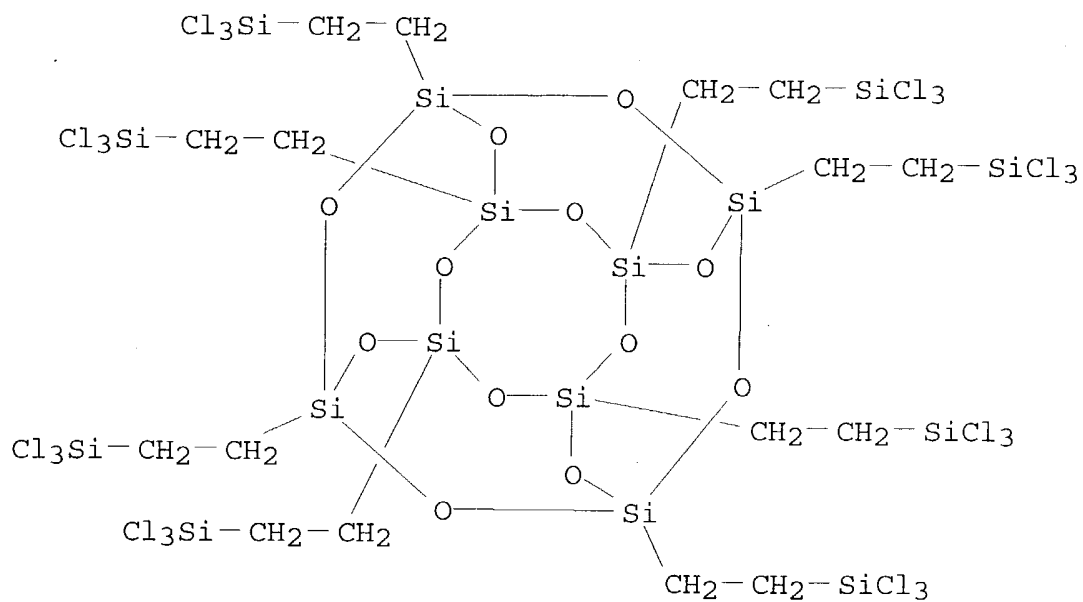


IT 214675-88-4 214676-02-5

(in silsesquioxane synthesis; prepn. of alkylphosphine-contg.
polyhedral oligosilsesquioxane-based dendrimers
 as ligands for rhodium catalysts and their application in
 hydrocarbonylation of alkenes)

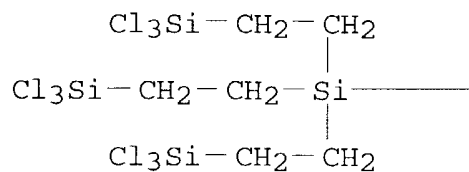
RN 214675-88-4 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octakis[2-
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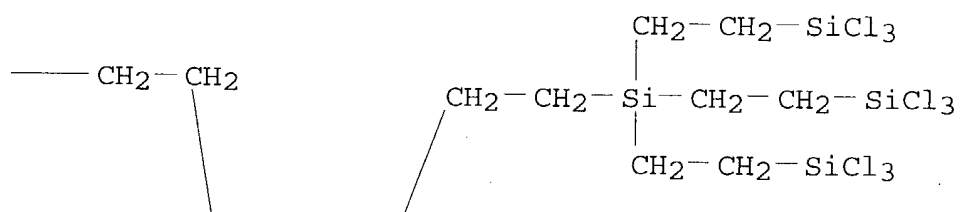


RN 214676-02-5 HCA
 CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octakis[2-[tris[2-(trichlorosilyl)ethyl)silyl]ethyl]- (9CI) (CA INDEX NAME)

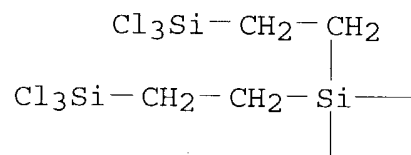
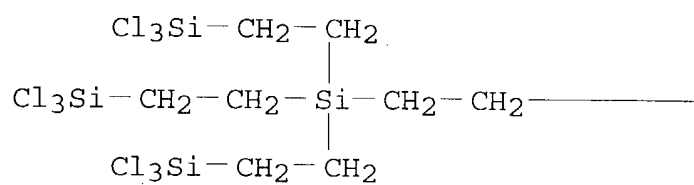
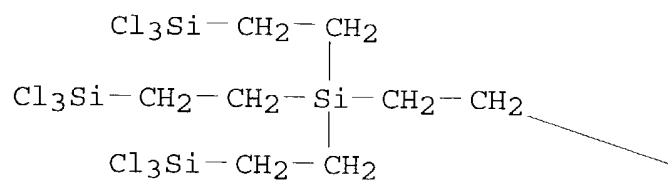
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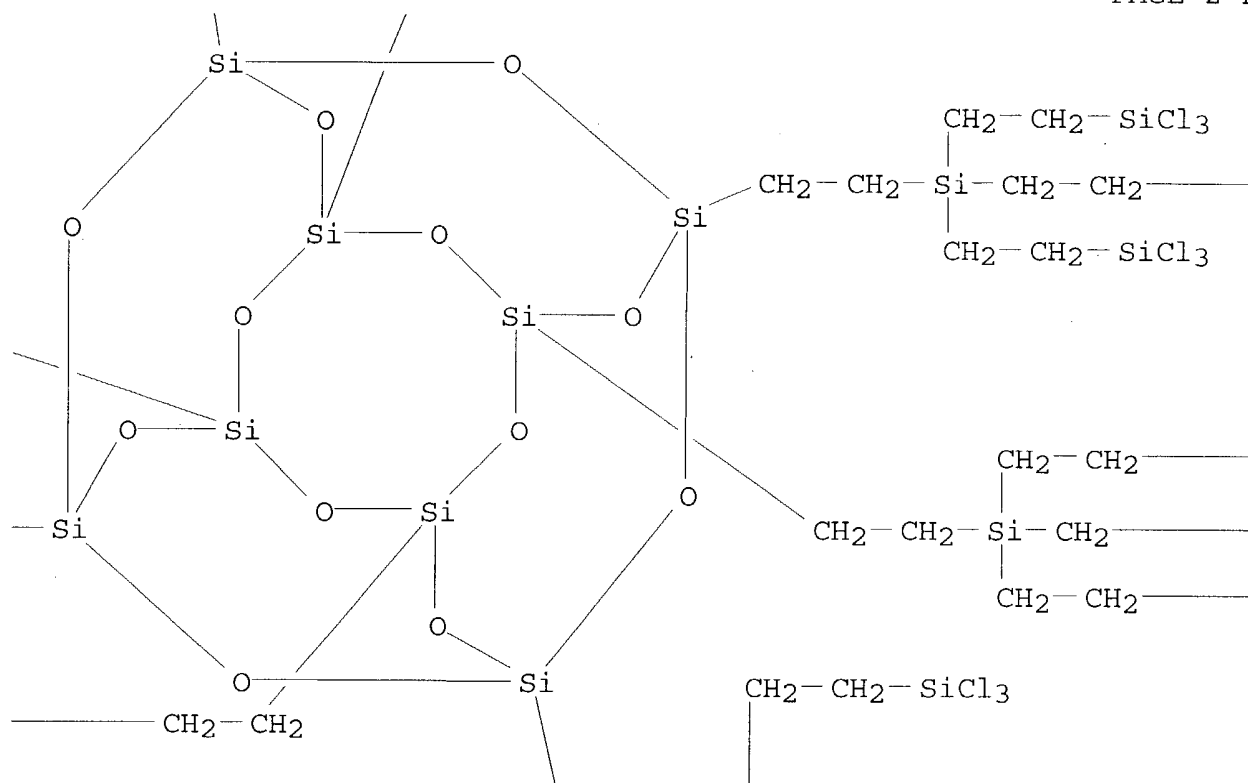
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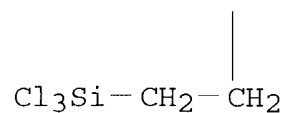
— SiCl_3

— SiCl_3

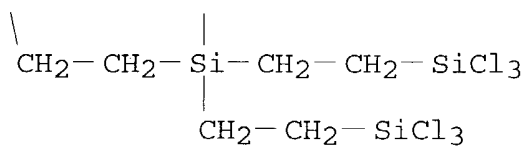
— $\text{CH}_2\text{-SiCl}_3$

— SiCl_3

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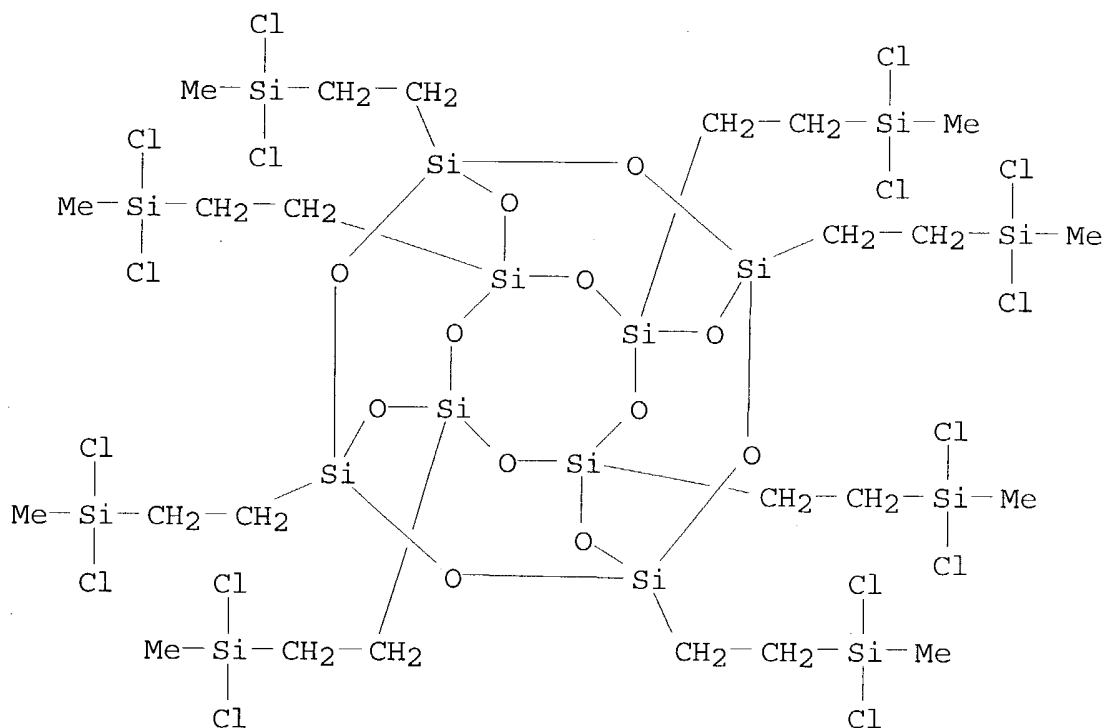
PAGE 3-B



IT 314727-18-9P 400002-80-4P
(in silsesquioxane synthesis; prepn. of alkylphosphine-contg.
polyhedral oligosilsesquioxane-based dendrimers
as ligands for rhodium catalysts and their application in
hydrocarbonylation of alkenes)

RN 314727-18-9 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octakis[2-
(dichloromethylsilyl)ethyl]- (9CI) (CA INDEX NAME)



RN 400002-80-4 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octakis[2-[tris[3-(dichloromethylsilyl)propyl]silyl]ethyl]- (9CI) (CA INDEX NAME)

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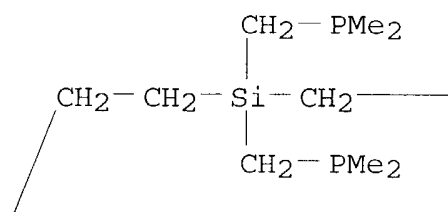
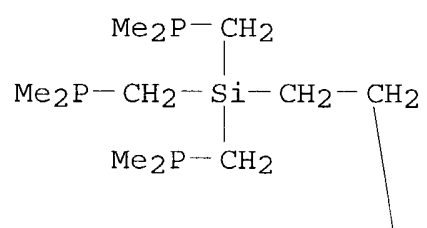
IT 329350-71-2P 329350-73-4P 445388-12-5P
445388-13-6P 445477-16-7P

(ligand; prepn. of alkylphosphine-contg. **polyhedral oligosilsesquioxane**-based dendrimers as ligands for rhodium catalysts and their application in hydrocarbonylation of alkenes)

RN 329350-71-2 HCA

CN Phosphine, [pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane-1,3,5,7,9,11,13,15-octayloctakis[2,1-ethanediylsilanetetrayltris(methylene)]]tetracosakis(dimethyl- (9CI) (CA INDEX NAME)

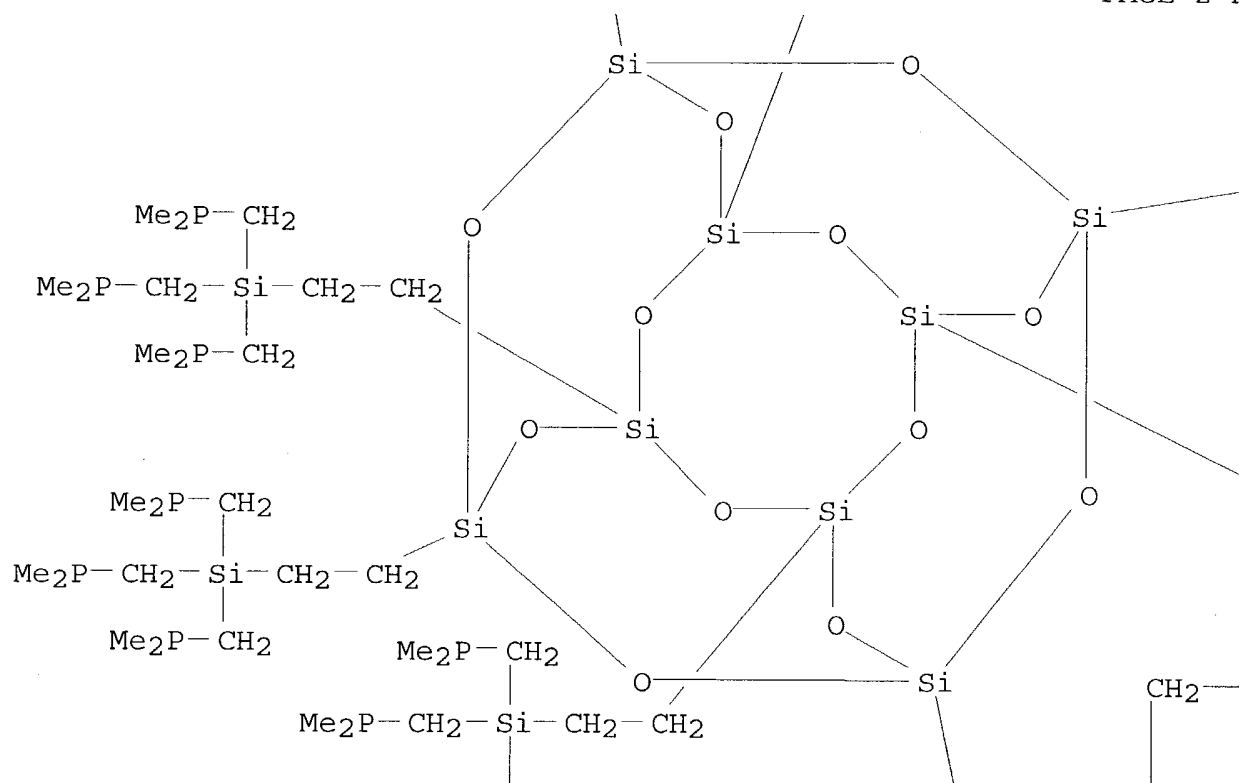
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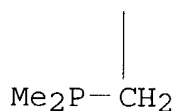
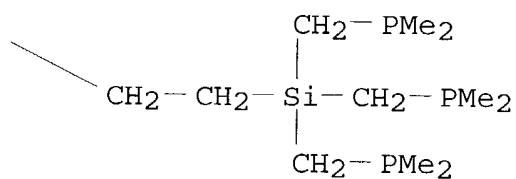
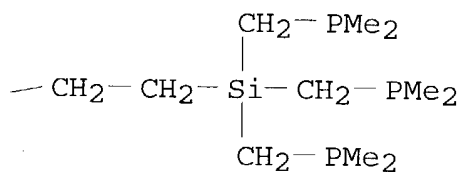
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—PMe₂

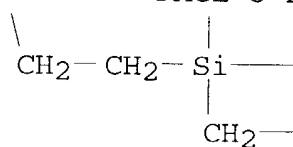
PAGE 2-A



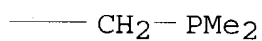
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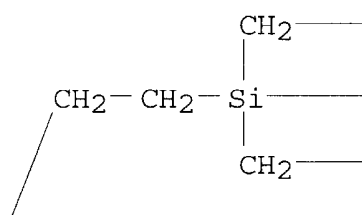
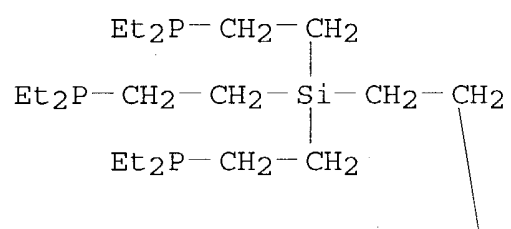
PAGE 3-B



RN 329350-73-4 HCA

CN Phosphine, [pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane-1,3,5,7,9,11,13,15-octayloctakis(2,1-ethanediylsilanetetrayltri-2,1-ethanediyl)]tetracosakis[diethyl- (9CI) (CA INDEX NAME)

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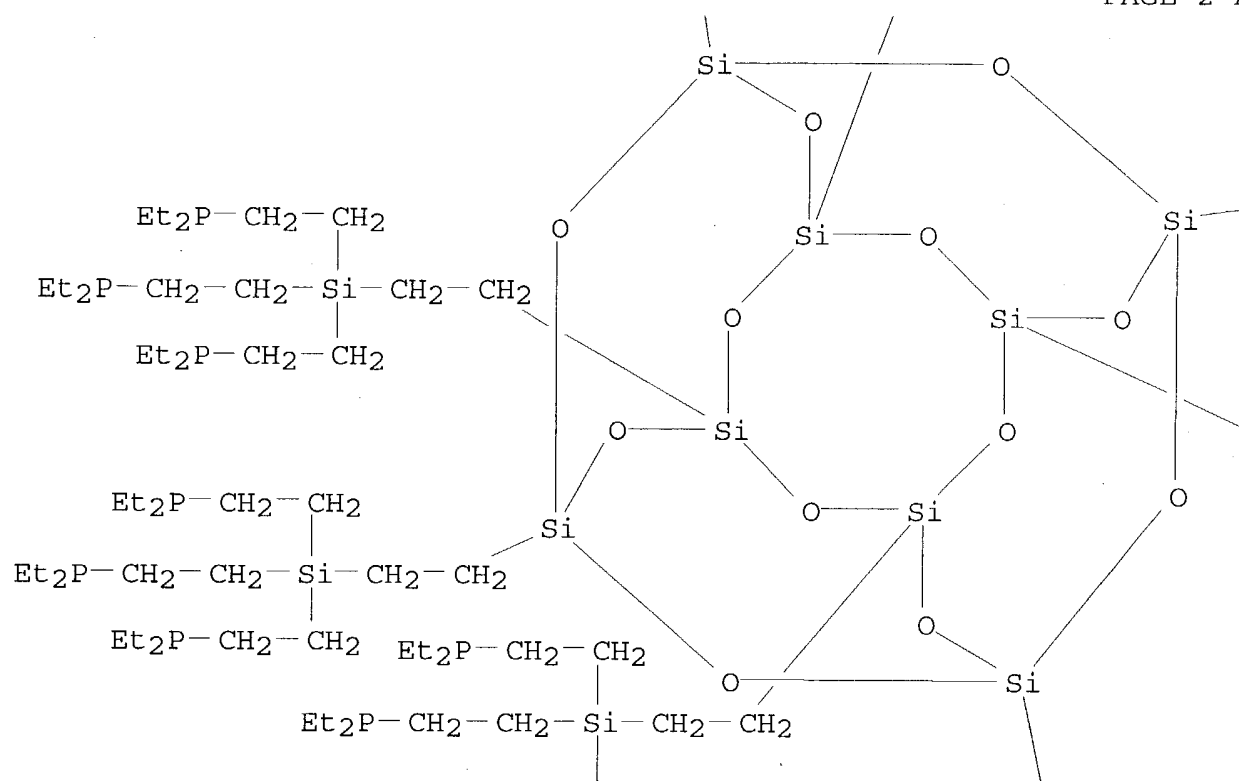
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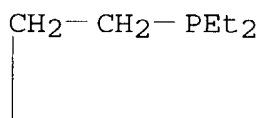
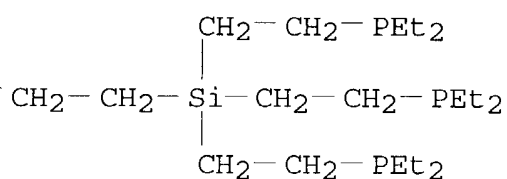
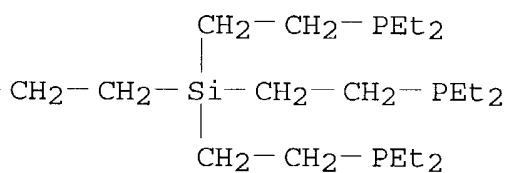
——— CH₂— CH₂— PEt₂

——— CH₂— PEt₂

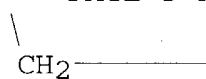
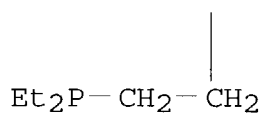
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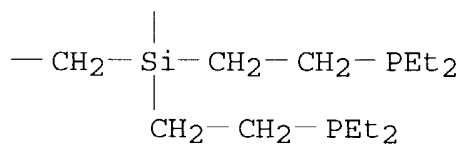
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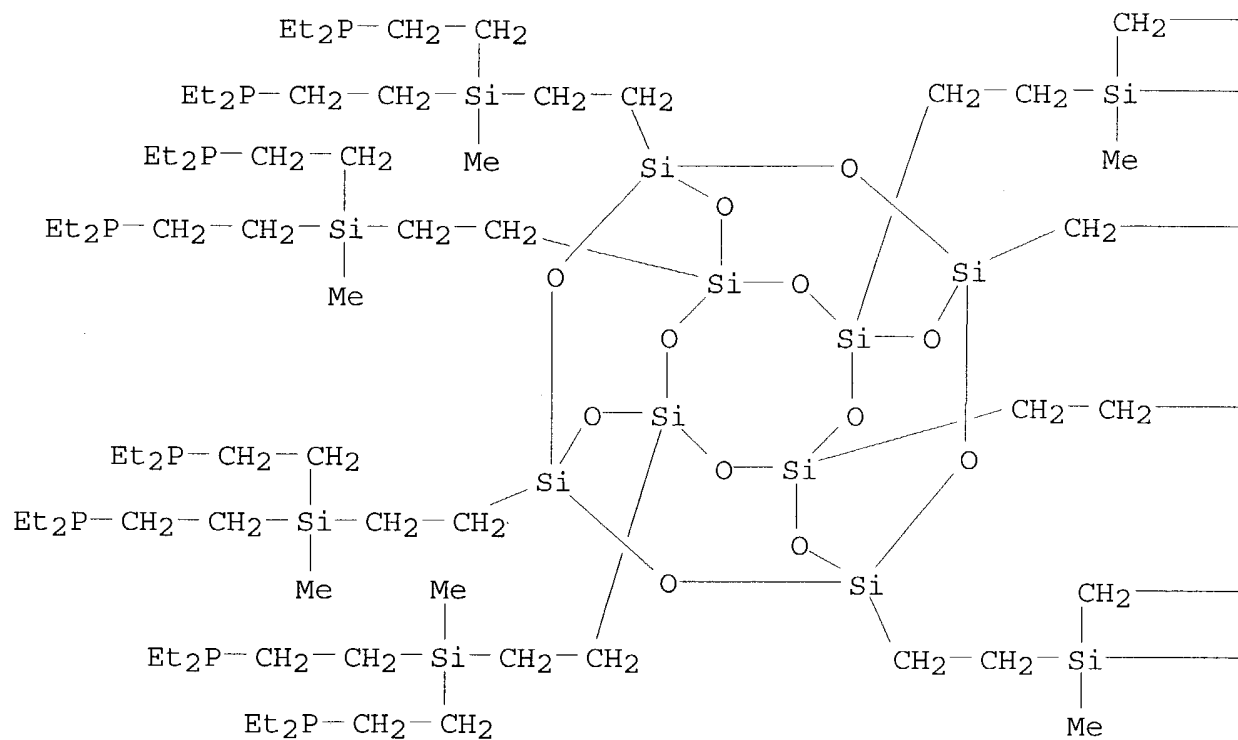


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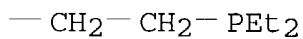
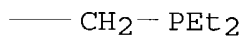
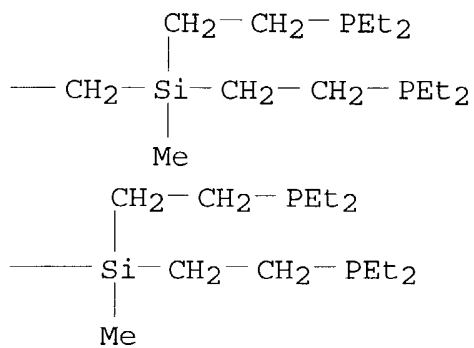
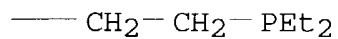


RN 445388-12-5 HCA
 CN Phosphine, [pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane-
 1,3,5,7,9,11,13,15-octayloctakis[2,1-ethanediyl(methylsilylidyne)di-
 2,1-ethanediyl]]hexadecakis[diethyl- (9CI) (CA INDEX NAME)

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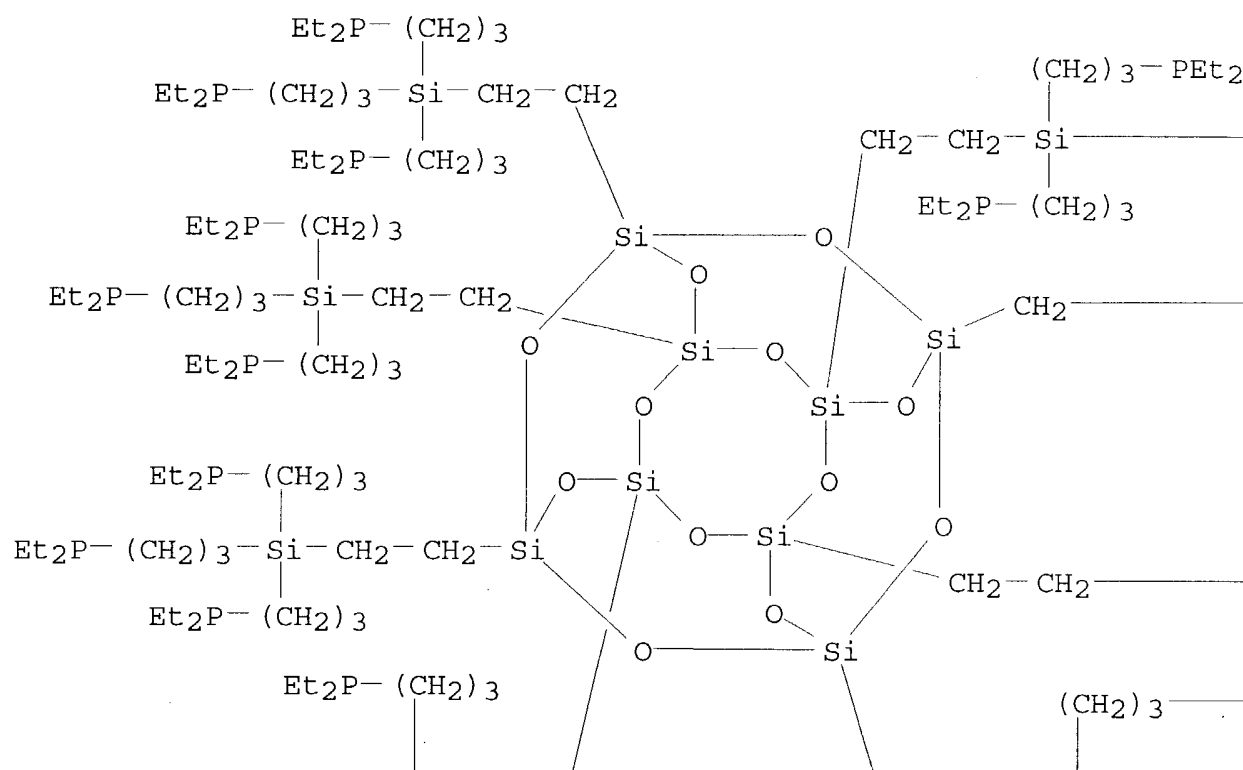
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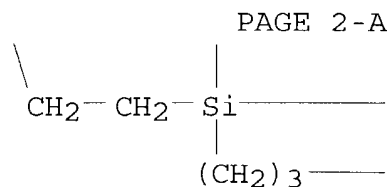
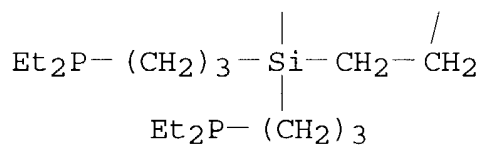
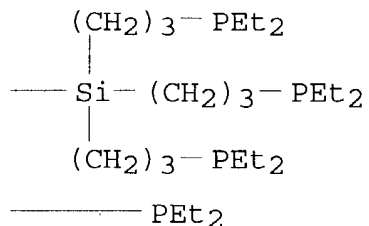
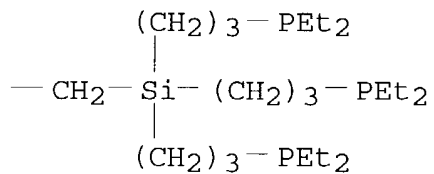
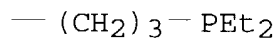
RN 445388-13-6 HCA

CN Phosphine, [pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane-1,3,5,7,9,11,13,15-octayloctakis(2,1-ethanediylsilanetetrayltri-3,1-propanediyl)]tetracosakis[diethyl- (9CI) (CA INDEX NAME)

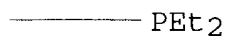
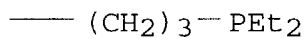
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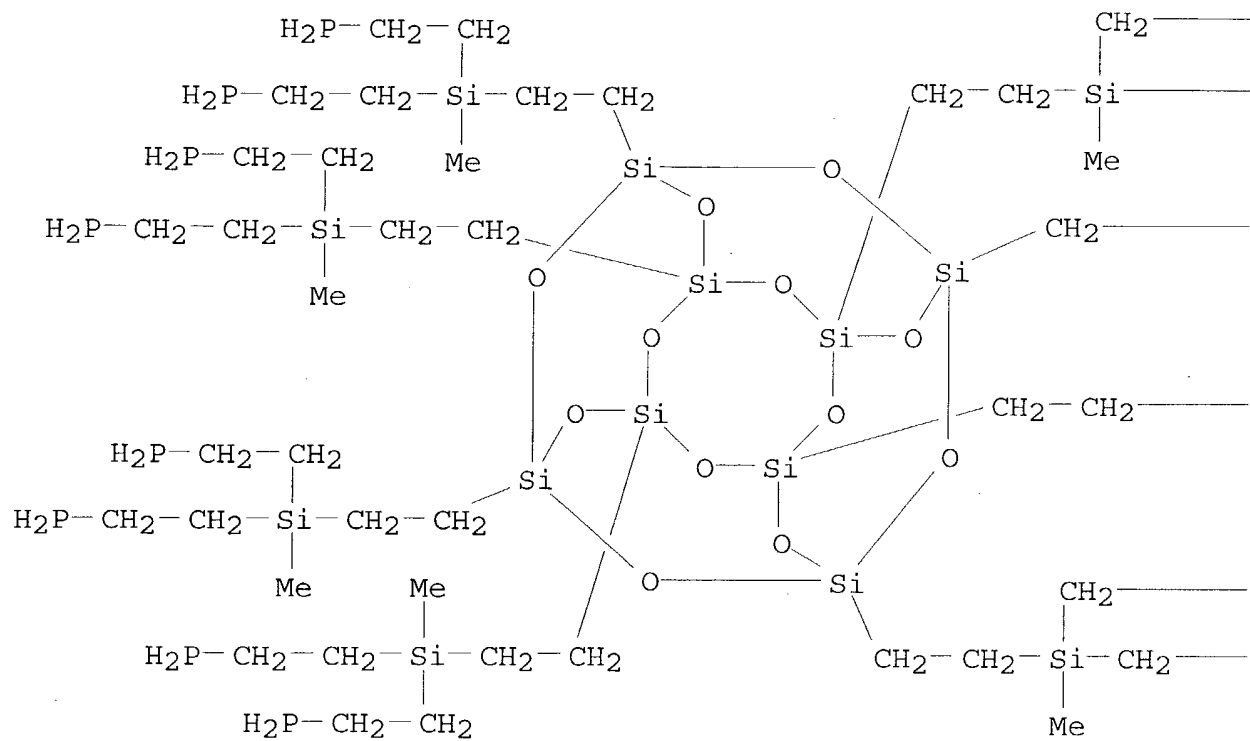
PAGE 2-B



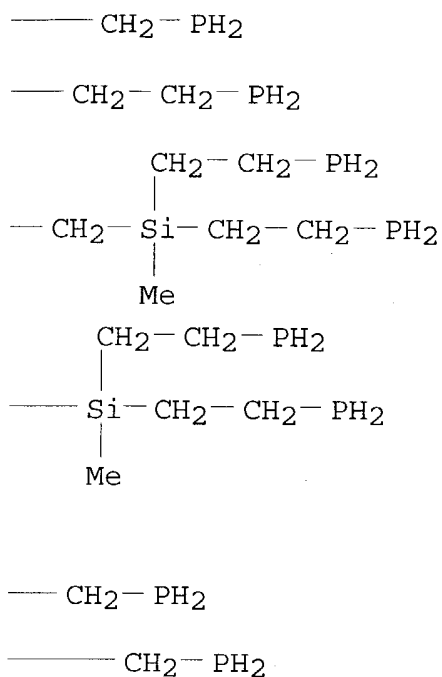
RN 445477-16-7 HCA

CN Phosphine, [pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane-1,3,5,7,9,11,13,15-octayloctakis[2,1-ethanediyl(methylsilylidyne)di-2,1-ethanediyl]]hexadecakis- (9CI) (CA INDEX NAME)

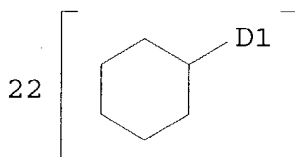
PAGE 1-A



PAGE 1-B



PAGE 2-A



10 (D1-Et)

- CC 38-3 (Plastics Fabrication and Uses)
 Section cross-reference(s): 23, 45, 67, 75
- IT Synthesis gas
 (hydrocarbonylation agent; prepn. of alkylphosphine-contg.
polyhedral oligosilsesquioxane-based dendrimers
 as ligands for rhodium catalysts and their application in
 hydrocarbonylation of alkenes)
- IT Alcohols, preparation
 Aldehydes, preparation
 (hydrocarbonylation products; prepn. of alkylphosphine-contg.)

- polyhedral oligosilsesquioxane**-based dendrimers as ligands for rhodium catalysts and their application in hydrocarbonylation of alkenes)
- IT Crystal structure
(prepn. of alkylphosphine-contg. **polyhedral oligosilsesquioxane**-based dendrimers as ligands for rhodium catalysts and their application in hydrocarbonylation of alkenes)
- IT Alkenes, reactions
(prepn. of alkylphosphine-contg. **polyhedral oligosilsesquioxane**-based dendrimers as ligands for rhodium catalysts and their application in hydrocarbonylation of alkenes)
- IT Carbonylation kinetics
(reductive (hydrocarbonylation); prepn. of alkylphosphine-contg. **polyhedral oligosilsesquioxane**-based dendrimers as ligands for rhodium catalysts and their application in hydrocarbonylation of alkenes)
- IT Carbonylation catalysts
(reductive, ligands for; prepn. of alkylphosphine-contg. **polyhedral oligosilsesquioxane**-based dendrimers as ligands for rhodium catalysts and their application in hydrocarbonylation of alkenes)
- IT 594-09-2, Trimethylphosphine
(comparison ligand; prepn. of alkylphosphine-contg. **polyhedral oligosilsesquioxane**-based dendrimers as ligands for rhodium catalysts and their application in hydrocarbonylation of alkenes)
- IT 69655-76-1
(core; prepn. of alkylphosphine-contg. **polyhedral oligosilsesquioxane**-based dendrimers as ligands for rhodium catalysts and their application in hydrocarbonylation of alkenes)
- IT 110-63-4, 1,4-Butanediol, uses 111-70-6, 1-Heptanol 112-30-1, 1-Decanol 124-19-6, Nonanal 143-08-8, 1-Nonanol 624-22-6, 2-Methyl-1-hexanol 818-81-5, 2-Methyl-1-octanol 7786-29-0, 2-Methyloctanal 40589-14-8, 2-Methyl-1-nonanol
(hydrocarbonylation product; prepn. of alkylphosphine-contg. **polyhedral oligosilsesquioxane**-based dendrimers as ligands for rhodium catalysts and their application in hydrocarbonylation of alkenes)
- IT 111-25-1, 1-Bromohexane 676-83-5, Dichloromethylphosphine
(in prepn. of alkylphosphines; prepn. of alkylphosphine-contg. **polyhedral oligosilsesquioxane**-based dendrimers as ligands for rhodium catalysts and their application in hydrocarbonylation of alkenes)
- IT 3385-84-0P, Di(n-hexyl)methylphosphine 3761-92-0P, Hexylmagnesium bromide
(in prepn. of alkylphosphines; prepn. of alkylphosphine-contg. **polyhedral oligosilsesquioxane**-based dendrimers as ligands for rhodium catalysts and their application in hydrocarbonylation of alkenes)

- IT 237752-45-3P 400002-79-1P 445388-11-4P
(in reaction with alkylphosphines; prepn. of alkylphosphine-contg. **polyhedral oligosilsesquioxane**-based dendrimers as ligands for rhodium catalysts and their application in hydrocarbonylation of alkenes)
- IT 627-49-6, Diethylphosphine 829-84-5, Dicyclohexylphosphine
(in reaction with **oligosilsesquioxanes**; prepn. of alkylphosphine-contg. **polyhedral oligosilsesquioxane**-based dendrimers as ligands for rhodium catalysts and their application in hydrocarbonylation of alkenes)
- IT 64065-06-1P 329350-70-1P, Dihexylphosphinomethylolithium
(in reaction with **oligosilsesquioxanes**; prepn. of alkylphosphine-contg. **polyhedral oligosilsesquioxane**-based dendrimers as ligands for rhodium catalysts and their application in hydrocarbonylation of alkenes)
- IT 75-54-7, Dichloromethylsilane 1730-25-2, Allylmagnesium bromide 1826-67-1, Vinylmagnesium bromide 214675-88-4 214676-02-5
(in silsesquioxane synthesis; prepn. of alkylphosphine-contg. **polyhedral oligosilsesquioxane**-based dendrimers as ligands for rhodium catalysts and their application in hydrocarbonylation of alkenes)
- IT 314727-18-9P 400002-80-4P 446034-07-7P
(in silsesquioxane synthesis; prepn. of alkylphosphine-contg. **polyhedral oligosilsesquioxane**-based dendrimers as ligands for rhodium catalysts and their application in hydrocarbonylation of alkenes)
- IT 329350-71-2P 329350-73-4P 329712-31-4P 329716-60-1P 445388-12-5P 445388-13-6P 445477-16-7P 446033-63-2P 446033-81-4P 446035-05-8P
(ligand; prepn. of alkylphosphine-contg. **polyhedral oligosilsesquioxane**-based dendrimers as ligands for rhodium catalysts and their application in hydrocarbonylation of alkenes)
- IT 14874-82-9, Rhodiumdicarbonyl acetylacetonate 15956-28-2, Rhodium diacetate dimer
(prepn. of alkylphosphine-contg. **polyhedral oligosilsesquioxane**-based dendrimers as ligands for rhodium catalysts and their application in hydrocarbonylation of alkenes)
- IT 107-18-6, 2-Propen-1-ol, reactions 111-66-0, 1-Octene 124-11-8, 1-Nonene 592-41-6, 1-Hexene, reactions
(prepn. of alkylphosphine-contg. **polyhedral oligosilsesquioxane**-based dendrimers as ligands for rhodium catalysts and their application in hydrocarbonylation of alkenes)

polymers. Blanski, Rusty L.; Phillips, Shawn H.; Chaffee, Kevin; Lichtenhan, Joseph; Lee, Andre; Geng, Hei Ping (AFRL/PRSM, Air Force Research Laboratory, Edwards AFB, CA, 93524, USA). Materials Research Society Symposium Proceedings, 628 (Organic/Inorganic Hybrid Materials), CC6.27.1-CC6.27.6 (English) 2001. CODEN: MRSPDH. ISSN: 0272-9172. Publisher: Materials Research Society.

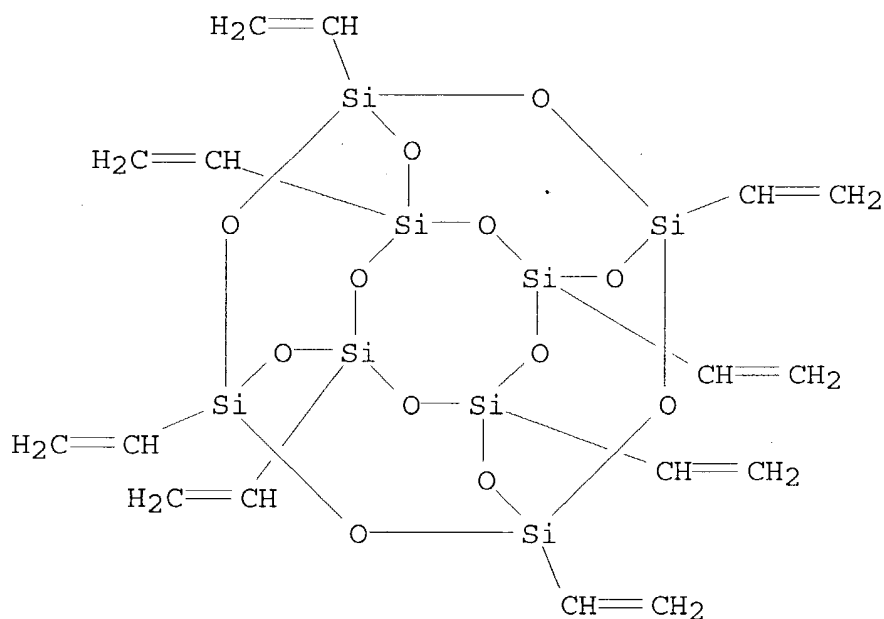
AB We have previously reported hybrid systems prep'd. by incorporating **polyhedral oligosilsesquioxanes** (POSS) into traditional org. polymers by the copolymn. of POSS monomers and org. monomers. This presentation will discuss a more convenient method of incorporating POSS into a polymer: the blending of POSS into org. polymers. The research discussion will focus on the development of the POSS macromers used in our studies as well as the POSS polymer blends synthesized. One important property enhancement obsd. is the increase in surface hardness for a POSS/polystyrene sample.

IT 69655-76-1 100691-57-4 183200-99-9
226726-51-8 268202-73-9

(prepn. of hybrid materials by blending of **polyhedral oligosilsesquioxanes** into polystyrene)

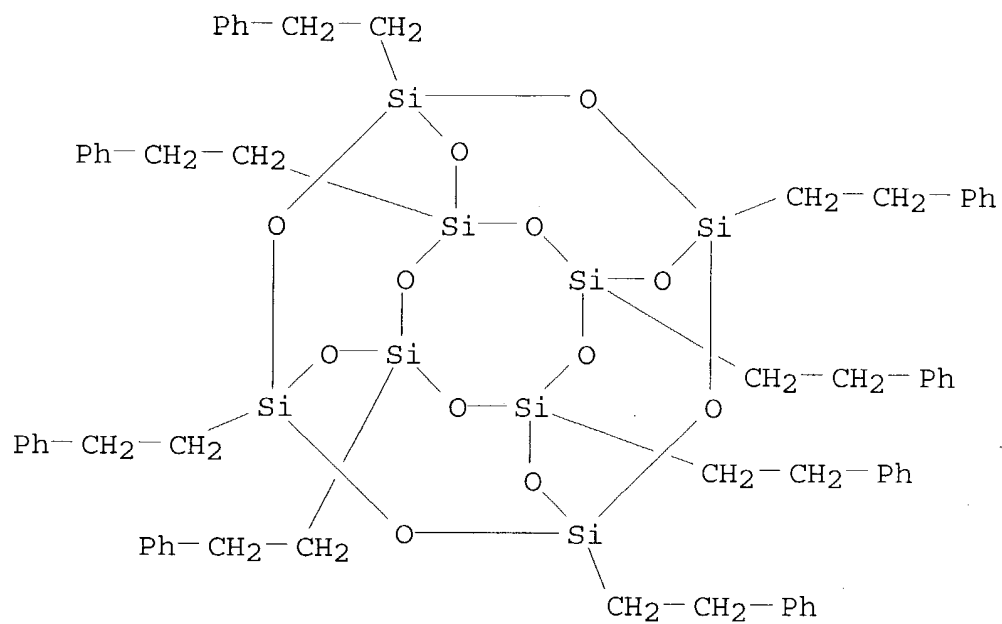
RN 69655-76-1 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octaethenyl- (9CI)
(CA INDEX NAME)



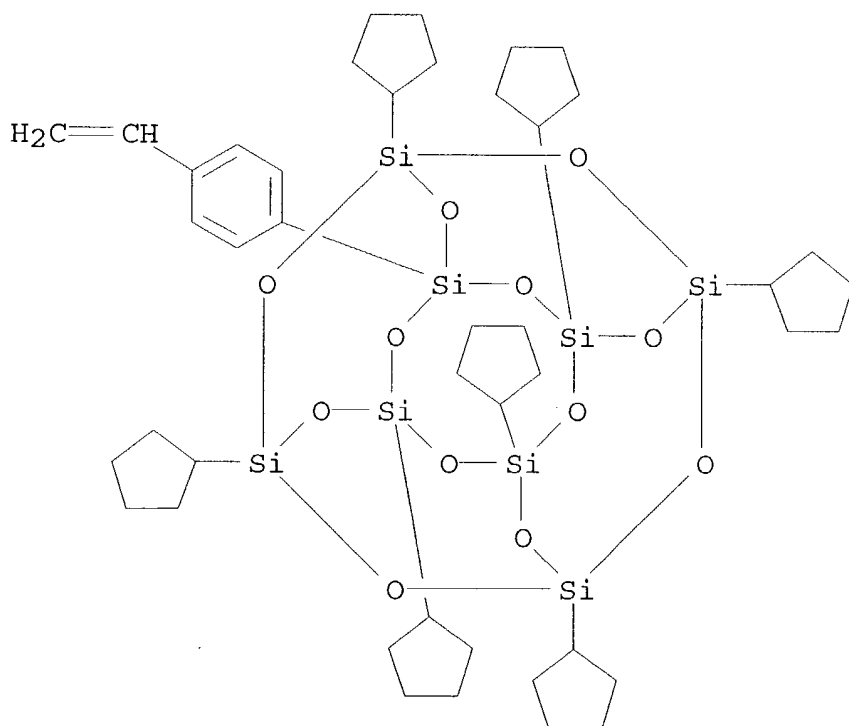
RN 100691-57-4 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octakis(2-phenylethyl)- (9CI) (CA INDEX NAME)



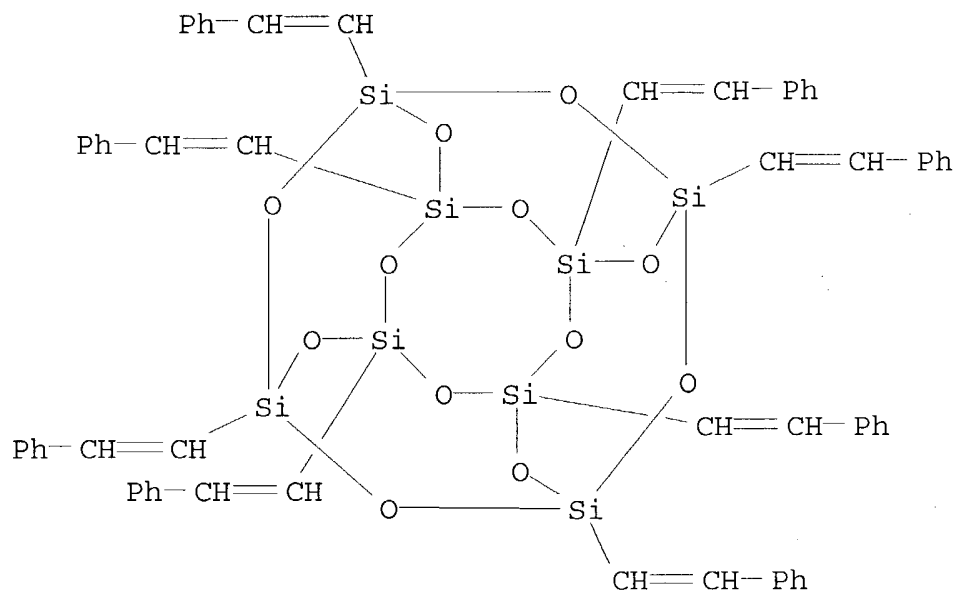
RN 183200-99-9 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, heptacyclopentyl(4-ethenylphenyl)- (9CI) (CA INDEX NAME)



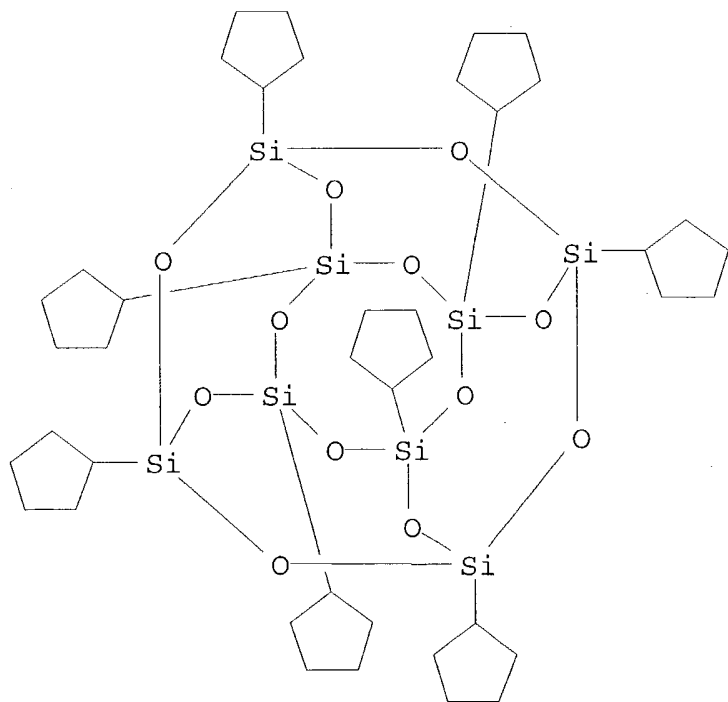
RN 226726-51-8 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octakis(2-phenylethenyl)- (9CI) (CA INDEX NAME)



RN 268202-73-9 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octacyclopentyl- (9CI) (CA INDEX NAME)



CC 35-6 (Chemistry of Synthetic High Polymers)
ST **oligosilsesquioxane** polymer blend hybrid material
IT Hybrid organic-inorganic materials
(prepn. of hybrid materials by blending of **polyhedral**
oligosilsesquioxanes into polystyrene)
IT Polymer blends
(prepn. of hybrid materials by blending of **polyhedral**
oligosilsesquioxanes into polystyrene)
IT 9003-53-6, Polystyrene 69655-76-1 100691-57-4
183200-99-9 226726-51-8 268202-73-9
(prepn. of hybrid materials by blending of **polyhedral**
oligosilsesquioxanes into polystyrene)

L46 ANSWER 9 OF 24 HCA COPYRIGHT 2003 ACS on STN

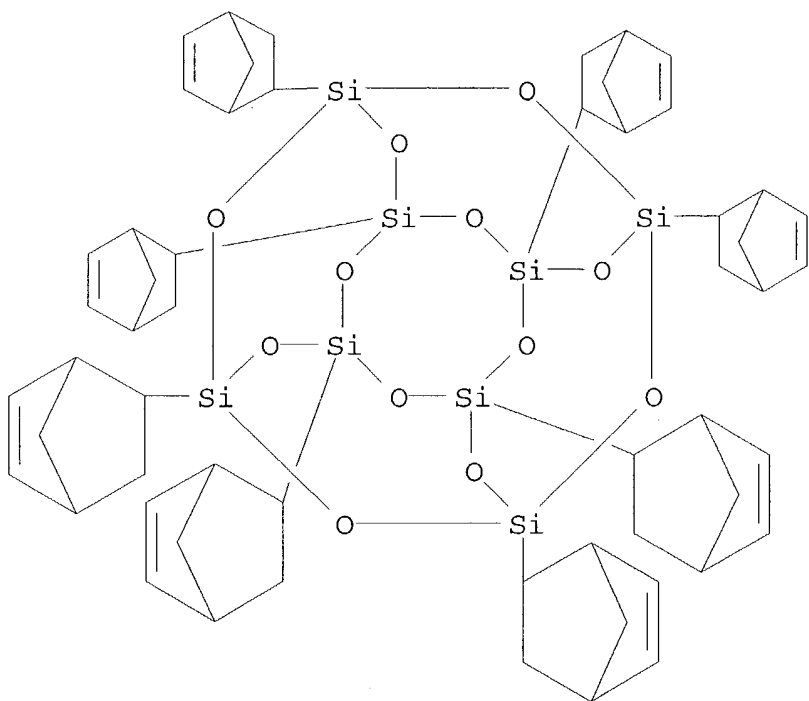
135:77328 Polyhedral oligomeric-silsesquioxanes, -silicates and
-siloxanes bearing ring-strained olefinic functionalities.
Lichtenhan, Joseph D.; Schwab, Joseph D.; An, Yi-Zong; Reinerth,
William; Feher, Frank J. (Hybrid Plastics, USA). PCT Int. Appl. WO
2001046295 A1 20010628, 20 pp. DESIGNATED STATES: W: AE, AG, AL,
AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE,
DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS,
JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK,
MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ,
TM, TR, TT, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU,
TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI,
FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG,
TR. (English). CODEN: PIXXD2. APPLICATION: WO 2000-US34873
20001222. PRIORITY: US 1999-PV171888 19991223; US 2000-747762
20001221.

AB Processes have been developed for the manuf. of polyhedral
oligomeric silsesquioxanes (POSS), polysilsesquioxanes, polyhedral
oligomeric silicates (POS), and siloxane mols. bearing reactive ring
strained olefins (e.g. norbornenyl, cyclopentenyl, etc.
functionalities). The manufg. processes employ the silylation of
siloxides with silane reagents contg. at least one reactive
ring-strained cyclic olefin functionality or hydrosilation reactions
between silanes contg. at least one silicon-hydrogen bond with
ring-strained cyclic olefin reagents. Each of the processes result
in a new chem. species bearing one or more ring strained olefins
that can undergo polymn., grafting, or other desirable chem.
reactions to form polymeric products.

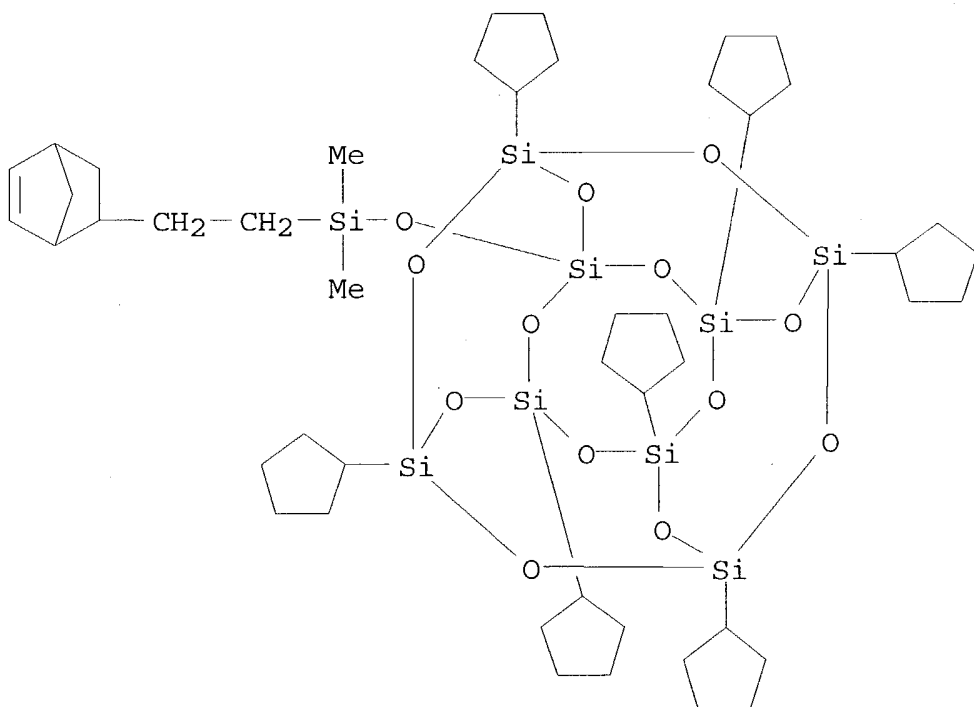
IT 111619-18-2P 307496-18-0P 347181-84-4P
(polyhedral oligomeric-silsesquioxanes, -silicates and -siloxanes
bearing ring-strained olefinic functionalities)

RN 111619-18-2 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane,
octakis(bicyclo[2.2.1]hept-5-en-2-yl)- (9CI) (CA INDEX NAME)

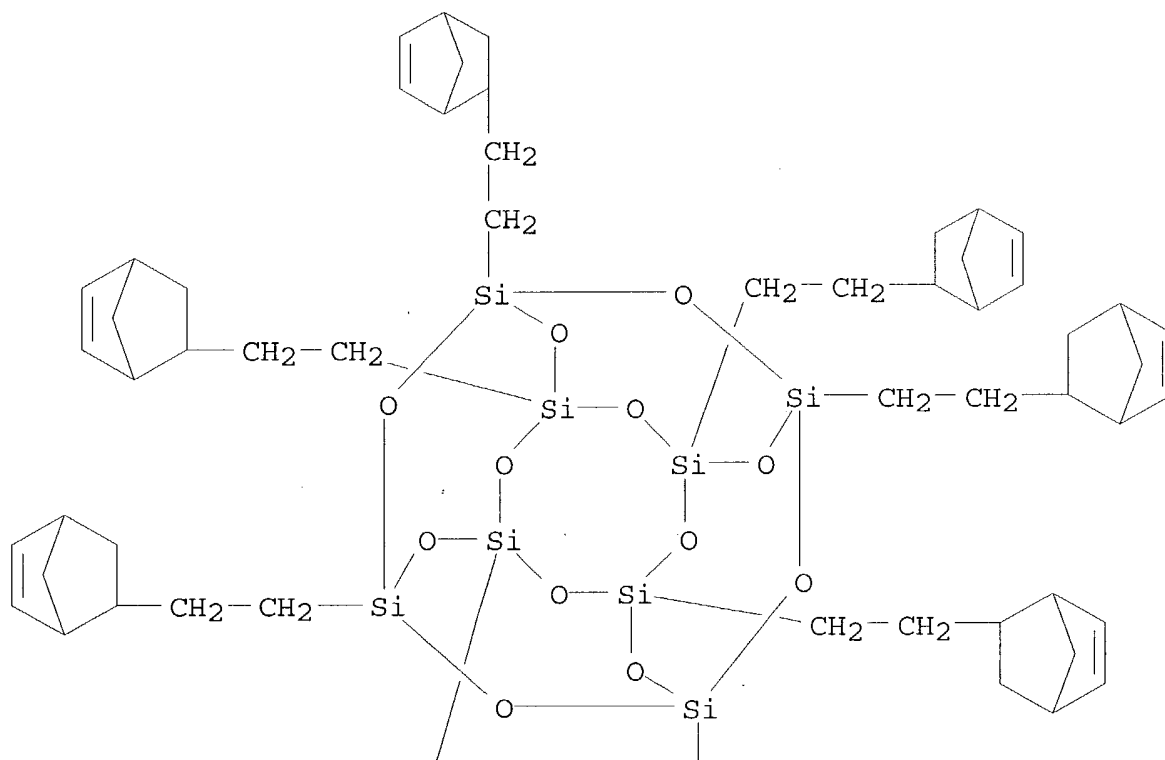


RN 307496-18-0 HCA
CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, [[(2-bicyclo[2.2.1]hept-5-en-2-ylethyl)dimethylsilyl]oxy]heptacyclopentyl-
(9CI) (CA INDEX NAME)

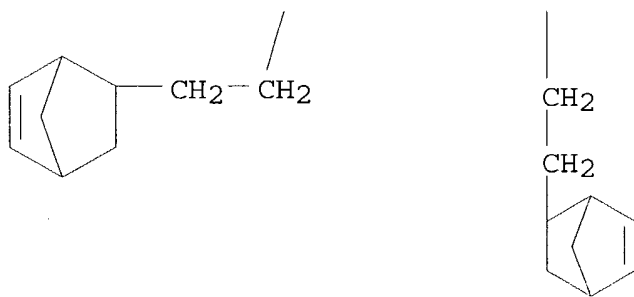


RN 347181-84-4 HCA
CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octakis(2-bicyclo[2.2.1]hept-5-en-2-ylethyl)- (9CI) (CA INDEX NAME)

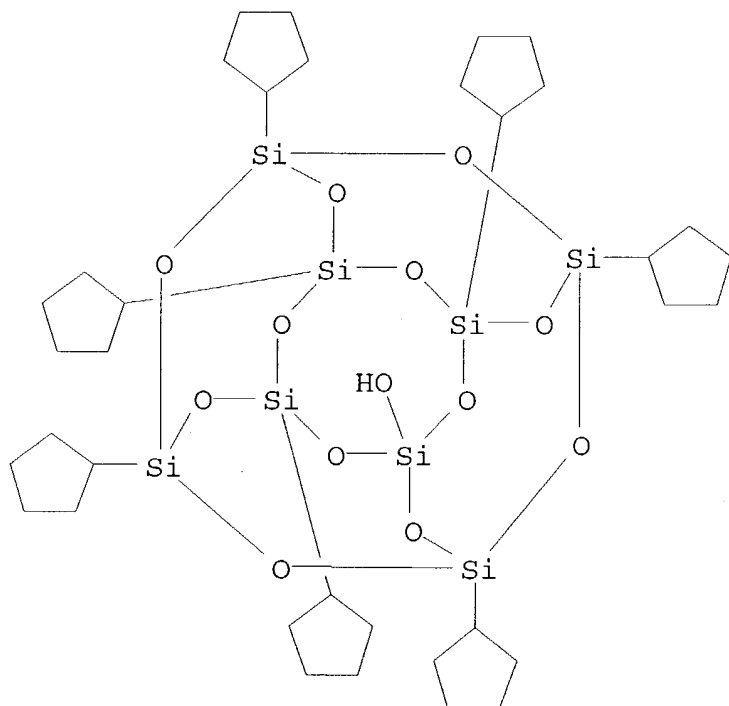
PAGE 1-A



PAGE 2-A



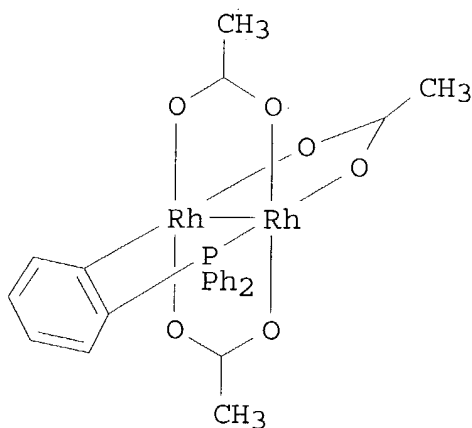
IT 216972-58-6
 (reactant; polyhedral oligomeric-silsesquioxanes, -silicates and
 -siloxanes bearing ring-strained olefinic functionalities)
 RN 216972-58-6 HCA
 CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanol, heptacyclopentyl-
 (9CI) (CA INDEX NAME)



- IC ICM C08G077-02
 ICS C08G077-04; C08G077-06; C08G077-20; C07F007-08
 CC 35-8 (Chemistry of Synthetic High Polymers)
 ST POS POSS ring strained olefin deriv manuf;
oligosilsesquioxane silicate ring strained olefin deriv;
 cage polymer **oligosilsesquioxane** silicate ring strained
 olefin deriv; norbornenyl deriv cage polymer
oligosilsesquioxane; cyclic olefin deriv cage polymer
oligosilsesquioxane; oligomeric polyhedral silsesquioxane
 silicate ring strained olefin deriv; telechelic polyhedral
 silsesquioxane ring strained olefin deriv manuf
- IT **111619-18-2P** 198570-39-7P **307496-18-0P**
 307496-39-5P 307496-40-8P 307496-41-9P 307496-42-0P
 314727-33-8P 326621-09-4P 347181-67-3P **347181-84-4P**
 (polyhedral oligomeric-silsesquioxanes, -silicates and -siloxanes
 bearing ring-strained olefinic functionalities)
- IT 541-05-9, Hexamethyltrisiloxane 1000-05-1, Octamethyltetrasiloxane
 2488-01-9, 1,4-Bis(dimethylsilyl)benzene 3048-64-4,
 5-Vinylnorbornene 3325-29-9 18401-43-9 120543-78-4
 183387-28-2 198570-38-6 **216972-58-6** 331283-06-8
 347181-79-7
 (reactant; polyhedral oligomeric-silsesquioxanes, -silicates and
 -siloxanes bearing ring-strained olefinic functionalities)
- L46 ANSWER 10 OF 24 HCA COPYRIGHT 2003 ACS on STN
 134:372180 Heterogeneous dinuclear rhodium(II) hydroformylation
 catalysts - performance evaluation and silsesquioxane-based chemical
 modeling. Nowotny, Mathias; Maschmeyer, Thomas; Johnson, Brian F.

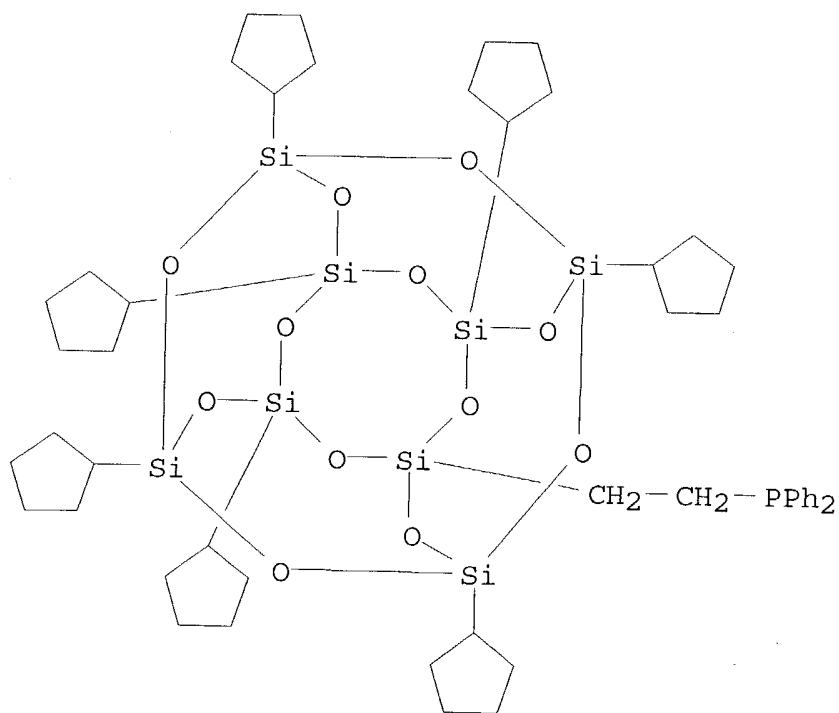
G.; Lahuerta, Pascual; Thomas, John Meurig; Davies, John E.
 (Laboratory for Applied Organic Chemistry and Catalysis Delft
 ChemTech, Delft University of Technology, Delft, 2628 BL, Neth.).
 Angewandte Chemie, International Edition, 40(5), 955-958 (English)
 2001. CODEN: ACIEF5. ISSN: 1433-7851. Publisher: Wiley-VCH Verlag
 GmbH.

GI



I

- AB Supported, air stable, and reusable hydroformylation catalysts have been prepd. by immobilizing dinuclear rhodium(II) complexes I bearing ortho-metalated arylphosphane ligands on amorphous silica and mesoporous MCM-41 supports by phosphane tethers. The **oligosilsesquioxane** model complex of the catalytic site has been prepd. analogously and characterized by single-crystal X-ray diffraction anal.
- IT 193404-80-7
 (heterogeneous dinuclear rhodium(II) hydroformylation catalysts and performance evaluation and silsesquioxane-based chem. modeling)
- RN 193404-80-7 HCA
- CN Phosphine, [2-(heptacyclopentylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)ethyl]diphenyl- (9CI) (CA INDEX NAME)



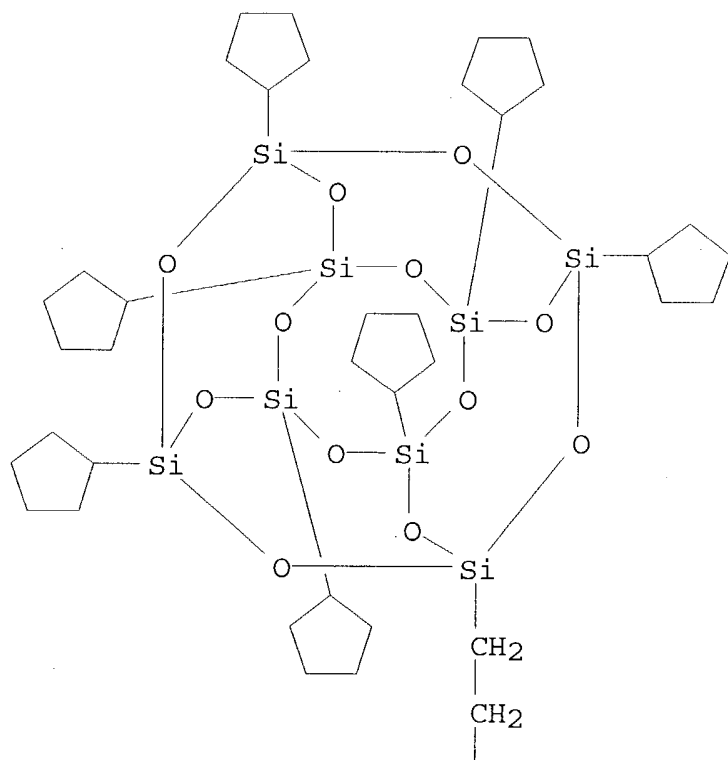
IT 340008-77-7P

(heterogeneous dinuclear rhodium(II) hydroformylation catalysts and performance evaluation and silsesquioxane-based chem. modeling)

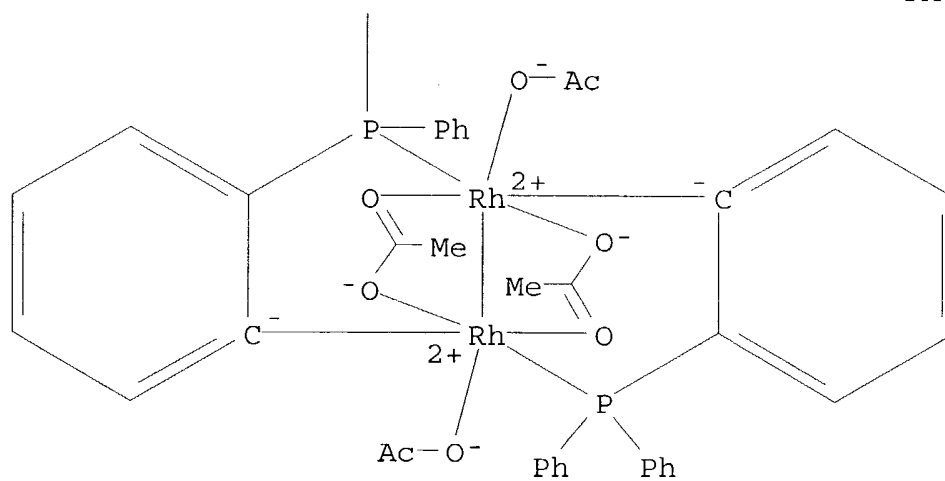
RN 340008-77-7 HCA

CN Rhodium, bis[.mu.-(acetato-.kappa.O:.kappa.O')]bis(acetato-.kappa.O)[.mu.-[2-(diphenylphosphino-.kappa.P)phenyl-.kappa.C]][.mu.-[2-[[2-(heptacyclopentylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)ethyl]phenylphosphino-.kappa.P]phenyl-.kappa.C]]di-, (Rh-Rh), stereoisomer (9CI) (CA INDEX NAME)

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Section cross-reference(s): 23

- IT **193404-80-7** 208117-79-7
(heterogeneous dinuclear rhodium(II) hydroformylation catalysts and performance evaluation and silsesquioxane-based chem. modeling)
- IT **340008-77-7P**
(heterogeneous dinuclear rhodium(II) hydroformylation catalysts and performance evaluation and silsesquioxane-based chem. modeling)

L46 ANSWER 11 OF 24 HCA COPYRIGHT 2003 ACS on STN

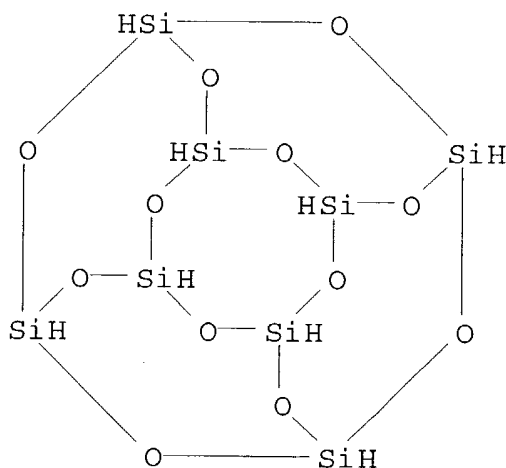
134:30443 Cage-like silsesquioxane-containing compositions useful for manufacture of optical films. Kita, Hiroshi; Takiyama, Nobuyuki (Konica Co., Japan). Jpn. Kokai Tokkyo Koho JP 2000334881 A2 20001205, 25 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1999-150069 19990528.

AB The compns. can be a metal oxide sol or gel compn. contg. a cage-like silsesquioxane, e.g., $[\text{RSiO}_{1.5}]_8$, $[\text{RSiO}_{1.5}]_{10}$, $[\text{RSiO}_{1.5}]_{12}$ and $[\text{RSiO}_{1.5}]_{14}$ (R = H, alkyl, alkenyl, aryl) in metal alkoxide or metal salt, a resin compn. contg. a cage-like silsesquioxane in a polymer or a polymer-composite metal oxide sol or gel compn. contg. a cage-like silsesquioxane in metal alkoxide- or metal salt-combined polymer. The title films with uniform micro void, low refractive index and high stiffness are manufd. by spin-coating one of the compns. on a transparent substrate such as acrylate panel and radiating under UV light and can be used as functional optical films such as antireflective films.

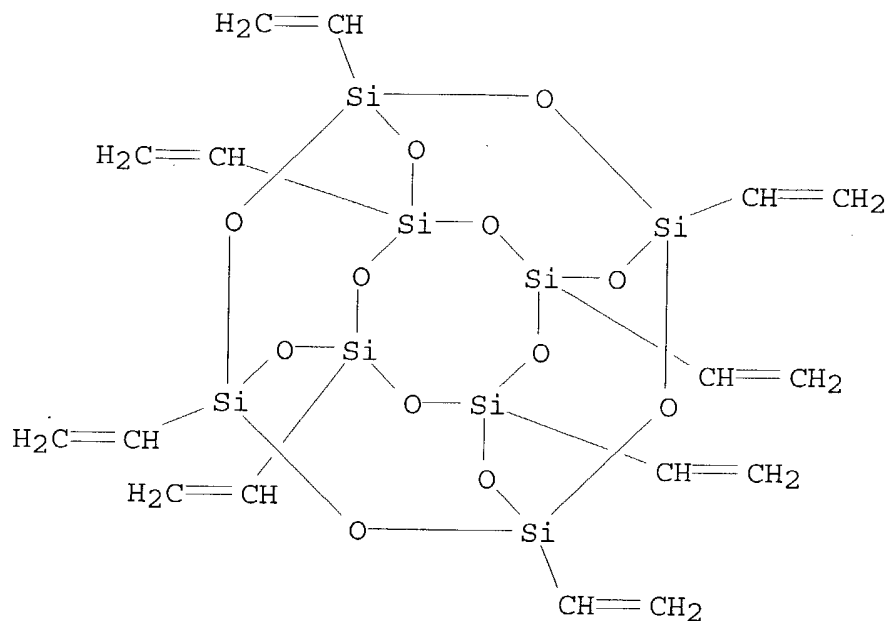
IT **281-50-5P**, Hydrogenooctasilsesquioxane **69655-76-1P**
125756-69-6P **169391-91-7P**
(cage-like silsesquioxane-contg. compns. useful for manuf. of optical films)

RN 281-50-5 HCA

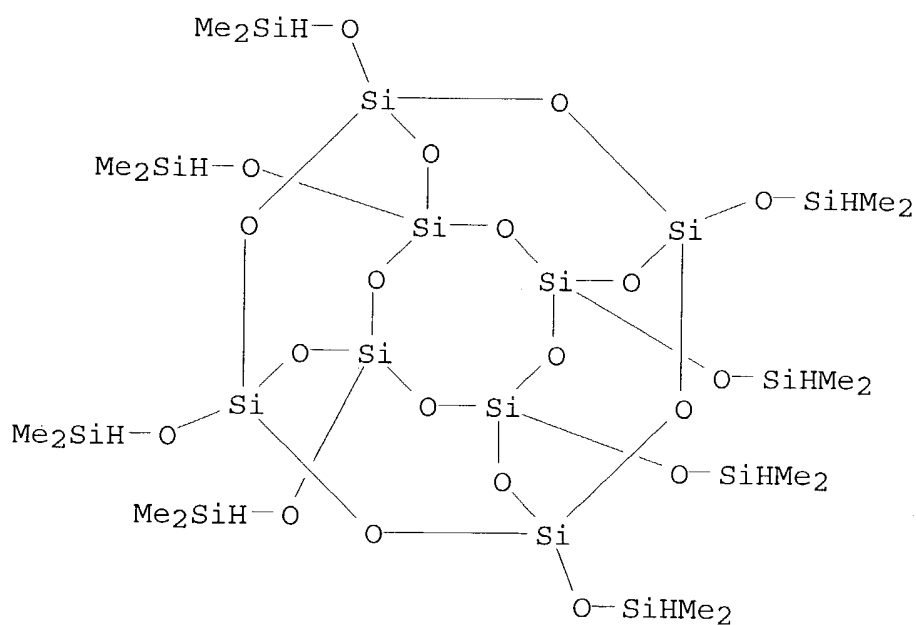
CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane (6CI, 8CI, 9CI) (CA INDEX NAME)



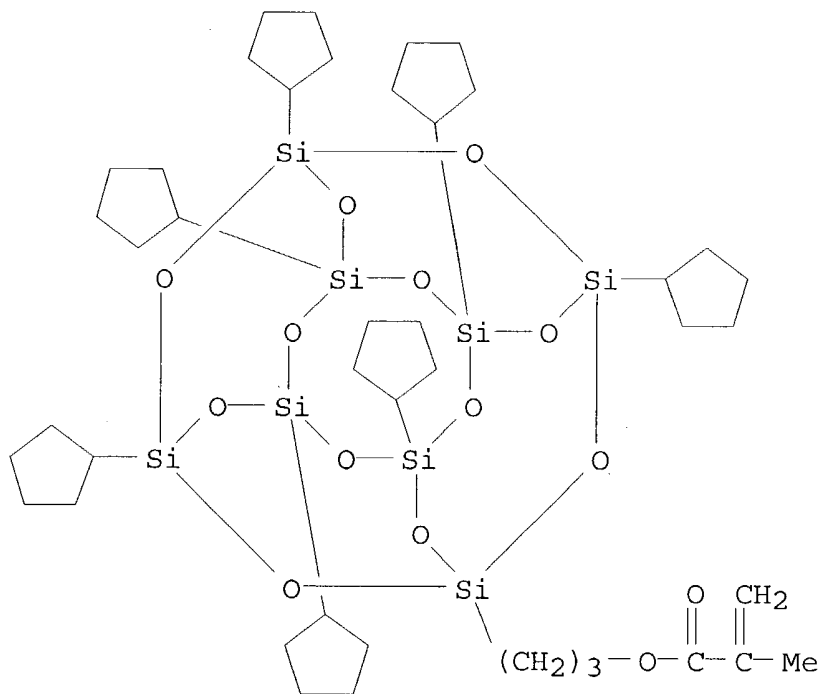
RN 69655-76-1 HCA
CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octaethenyl- (9CI)
(CA INDEX NAME)



RN 125756-69-6 HCA
CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane,
octakis[(dimethylsilyl)oxy]- (9CI) (CA INDEX NAME)



RN 169391-91-7 HCA
 CN 2-Propenoic acid, 2-methyl-, 3-(heptacyclopentylpentacyclo[9.5.1.1.3, 9.15,15.17,13]octasiloxanyl)propyl ester (9CI) (CA INDEX NAME)



IC ICM B32B009-00
 ICS C01B033-113; C03C017-28; C08G077-04; C08K003-22; C08K005-057;
 C08K005-09; C08L083-04; C08L101-16; C09D007-12; C09D183-04;
 C09D201-00; C07F007-18; C07F007-21; C08J005-18
 CC 42-10 (Coatings, Inks, and Related Products)
 Section cross-reference(s): 73, 74, 76
 ST cage like silsesquioxane compn optical film manuf; metal oxide
 alkoxide salt sol gel optical film manuf; polymer resin compn
 optical film manuf; composite metal oxide polymer optical film
 manuf; low refractive index optical film manuf; POSS stiffness
 optical film manuf; transparent acrylate substrate optical film
 manuf; antireflective functional optical film manuf;
polyhedral oligosilsesquioxane film forming compn
 IT 281-50-5P, Hydrogenoctasilsesquioxane 69655-76-1P
 125756-69-6P 169391-91-7P
 (cage-like silsesquioxane-contg. compns. useful for manuf. of
 optical films)

L46 ANSWER 12 OF 24 HCA COPYRIGHT 2003 ACS on STN
 132:335344 The preparation and properties of organic/inorganic hybrid
 materials by blending **polyhedral**
oligosilsesquioxanes into organic polymers. Blanski, Rusty
 L.; Phillips, Shawn H.; Chaffee, Kevin; Lichtenhan, Joseph; Lee,
 Andre; Geng, Hei Ping (Air Force Research Laboratory, AFRL/PRSM,

Edwards AFB, CA, 93524, USA). Polymer Preprints (American Chemical Society, Division of Polymer Chemistry), 41(1), 585-586 (English) 2000. CODEN: ACPPAY. ISSN: 0032-3934. Publisher: American Chemical Society, Division of Polymer Chemistry.

AB The synthesis of org. polymer/inorg. ceramic hybrid materials is a research area that is rapidly expanding. These hybrid materials have the advantage of combining two disparate materials which can result in something that may bridge the performance gap between the two systems. Hybrid systems having a direct linkage between the polymer and inorg. species have been prepd. previously by incorporating **polyhedral oligosilsesquioxanes** (POSS) into traditional org. polymers (polymethacrylate, polystyrene, polynorbornene) by std. polymer prepn. procedures. A more convenient method of incorporating POSS without a linkage into an org. polymer would be to blend it into the polymer. TEM studies of five POSS-polystyrene blends are used to demonstrate that **polyhedral oligosilsesquioxane** octamers can be dispersed into polystyrene by altering the org. side groups of the octamers.

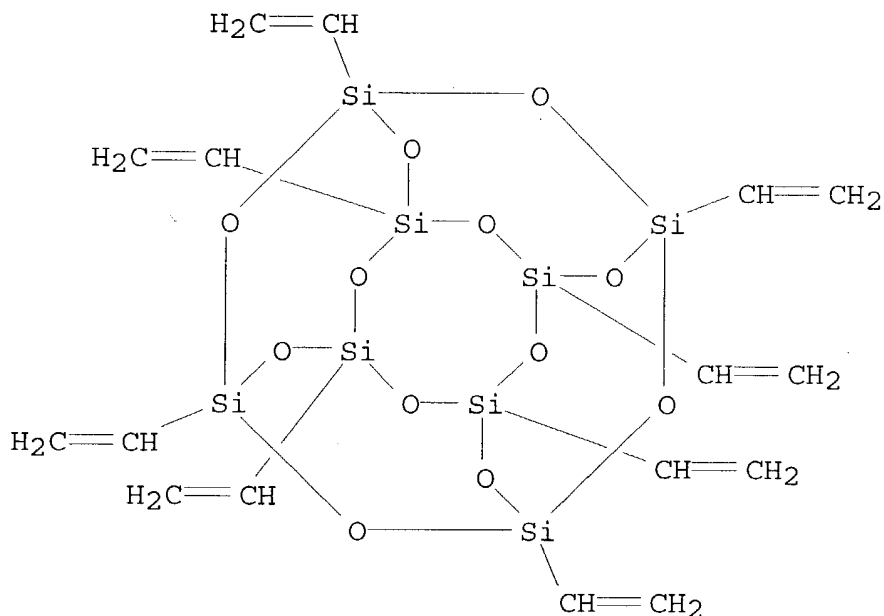
IT 69655-76-1 100691-57-4 183200-99-9

268202-73-9 268202-74-0

(prepn. and properties of org./inorg. hybrid materials by blending **polyhedral oligosilsesquioxane** octamers into polystyrene)

RN 69655-76-1 HCA

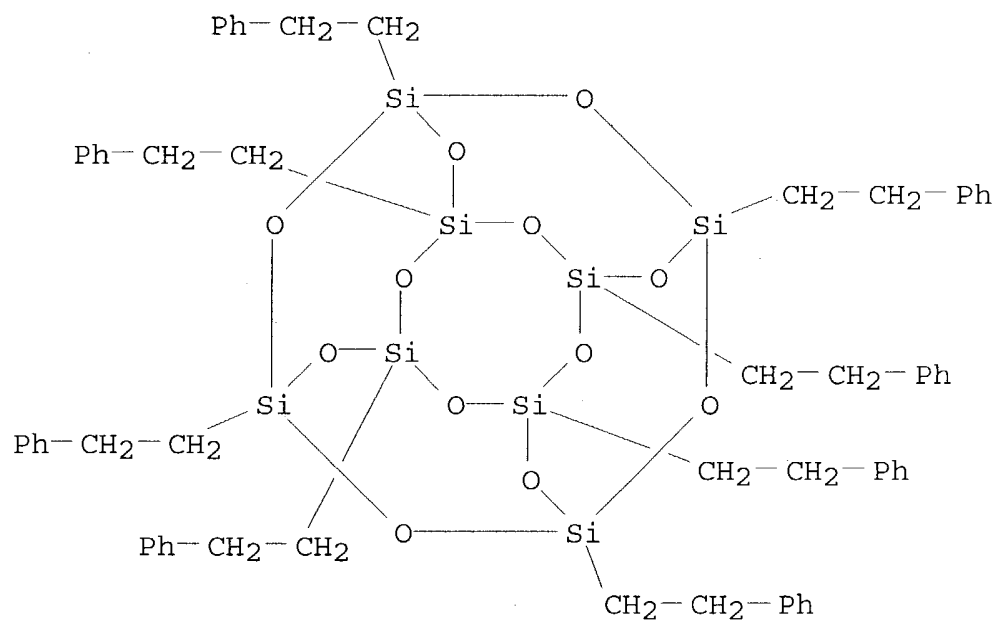
CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octaethenyl- (9CI)
(CA INDEX NAME)



RN 100691-57-4 HCA

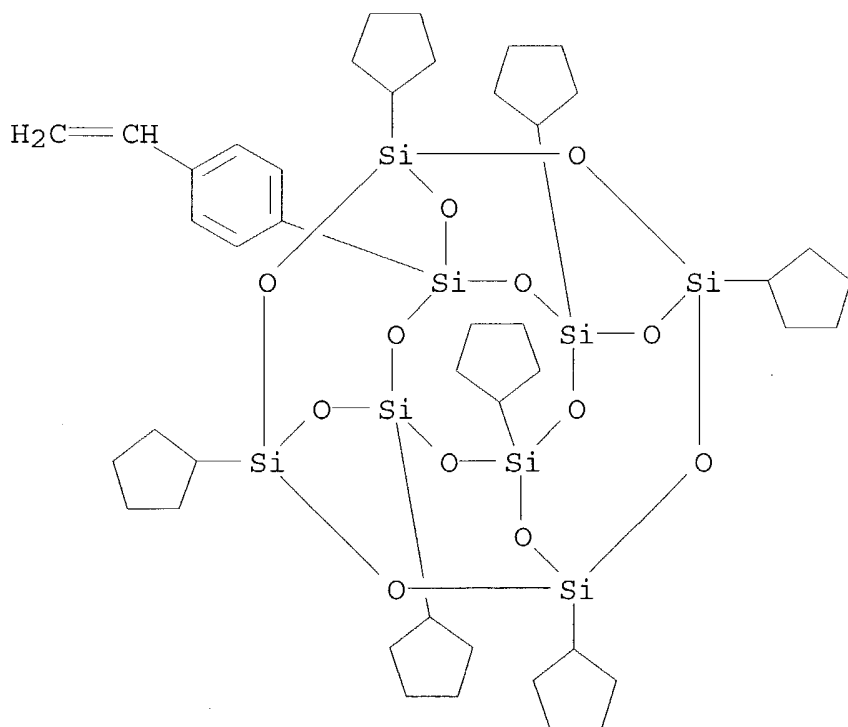
CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octakis(2-

phenylethyl)- (9CI) (CA INDEX NAME)

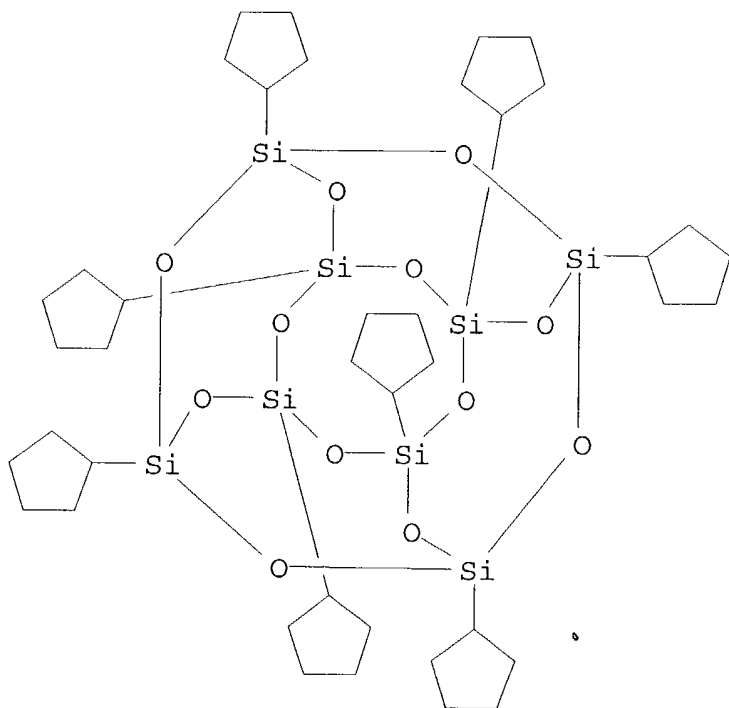


RN 183200-99-9 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, heptacyclopentyl(4-ethenylphenyl)- (9CI) (CA INDEX NAME)



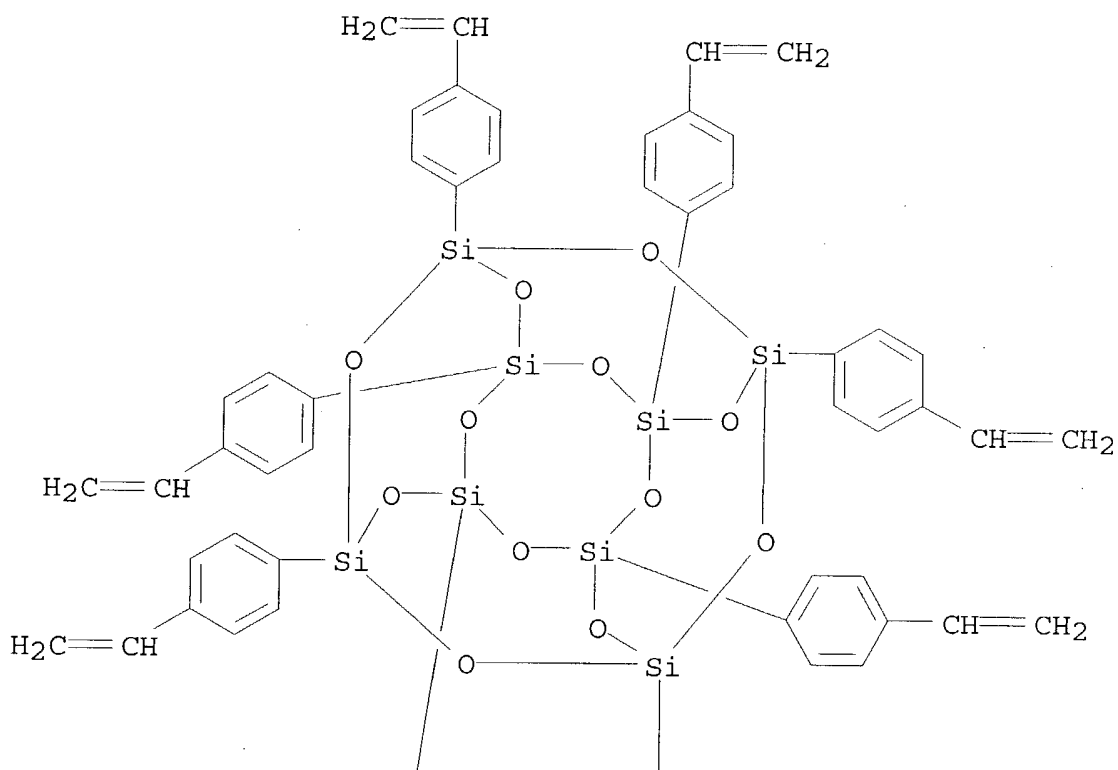
RN 268202-73-9 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octacyclopentyl-
(9CI) (CA INDEX NAME)

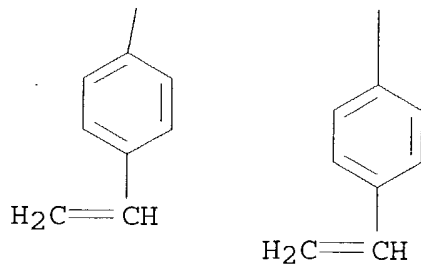
RN 268202-74-0 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octakis(4-
ethenylphenyl)- (9CI) (CA INDEX NAME)

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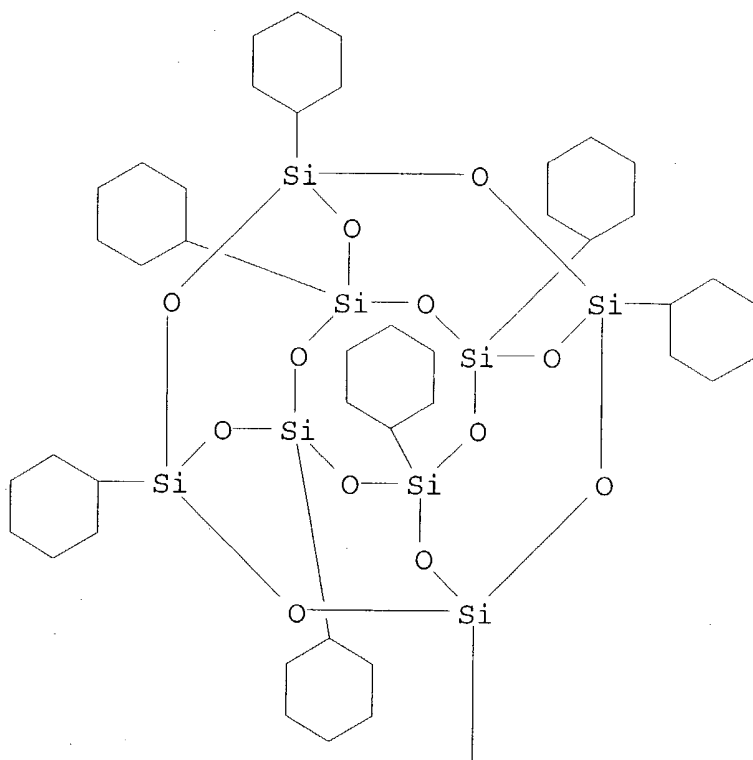
PAGE 2-A



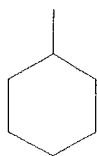
CC 37-6 (Plastics Manufacture and Processing)
 ST **polyhedral oligosilsesquioxane** octamer
 polystyrene hybrid; pentacyclo octasiloxane deriv polystyrene hybrid
 IT 69655-76-1 100691-57-4 183200-99-9
 268202-73-9 268202-74-0
 (prepn. and properties of org./inorg. hybrid materials by
 blending **polyhedral oligosilsesquioxane**
 octamers into polystyrene)

- IT 9003-53-6, Polystyrene
(prepn. and properties of org./inorg. hybrid materials by
blending **polyhedral oligosilsesquioxane**
octamers into polystyrene)
- L46 ANSWER 13 OF 24 HCA COPYRIGHT 2003 ACS on STN
132:107991 A new route to incompletely-condensed silsesquioxanes:
base-mediated cleavage of **polyhedral**
oligosilsesquioxanes. Feher, Frank J.; Terroba, Raquel;
Ziller, Joseph W. (Department of Chemistry, University of
California, Irvine, CA, 92697-2025, USA). Chemical Communications
(Cambridge) (22), 2309-2310 (English) 1999. CODEN: CHCOFS. ISSN:
1359-7345. OTHER SOURCES: CASREACT 132:107991. Publisher: Royal
Society of Chemistry.
- AB Readily available R8Si8O12 frameworks react selectively with aq.
Et4NOH to afford discrete incompletely-condensed silsesquioxanes:
reaction of R8Si8O12 (2a, R = c-C6H11; 2b, R = Bui) with Et4NOH 1st
produces endo-D2-R8Si8O11(OH)2 (3a, R = c-C6H11; 3b, R = Bui), which
reacts further with Et4NOH to produce endo-C2-R8Si8O10(OH)4 (4a and
4b) and endo-C3-R7Si7O9(OH)3 (5a, R = c-C6H11; 5b, R = Bui); the
reactions of Et4NOH with Me8Si8O12 (2c), (c-C6H11)7(H)Si8O12 (2d)
and (c-C6H11)7(OH)Si8O12 (2e) also produce the corresponding
trisilanols, i.e., endo-C3-R7Si7O9(OH)3 (5a, R = c-C6H11; 5c, R =
Me).
- IT 3809-28-7 3809-29-8 17865-85-9
221326-46-1 230316-14-0
(base-mediated cleavage of **polyhedral**
oligosilsesquioxanes)
- RN 3809-28-7 HCA
CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octacyclohexyl-
(7CI, 8CI, 9CI) (CA INDEX NAME)

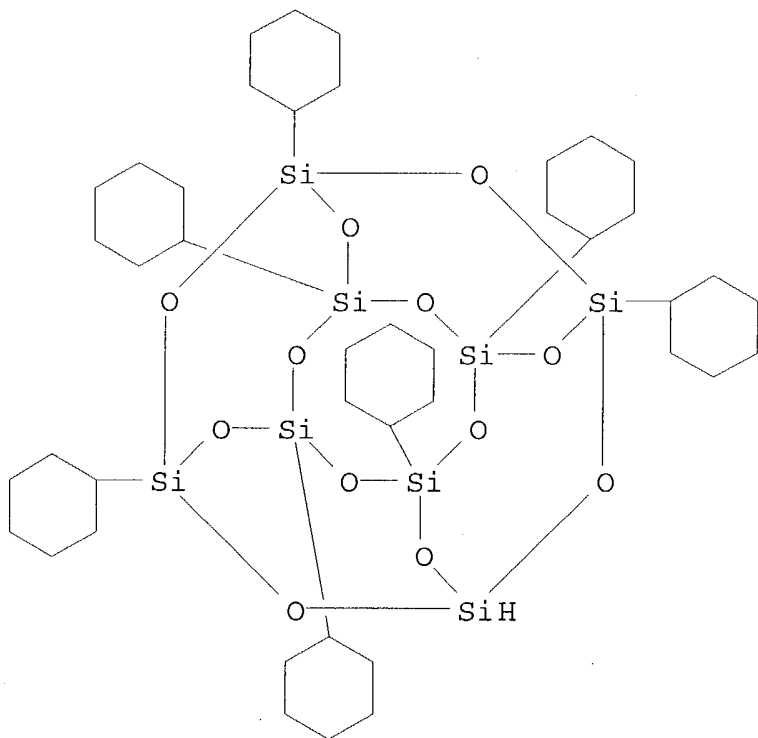
PAGE 1-A



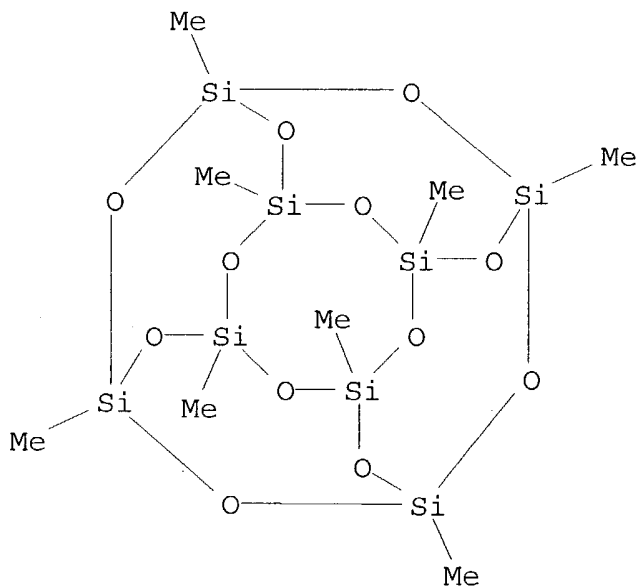
PAGE 2-A



RN 3809-29-8 HCA
CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, heptacyclohexyl-
(7CI, 8CI, 9CI) (CA INDEX NAME)

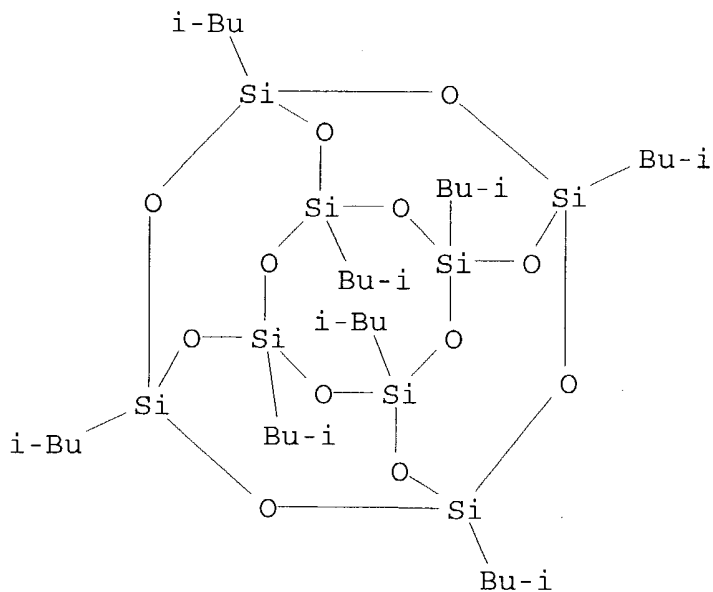


RN 17865-85-9 HCA
CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octamethyl- (7CI, 9CI) (CA INDEX NAME)



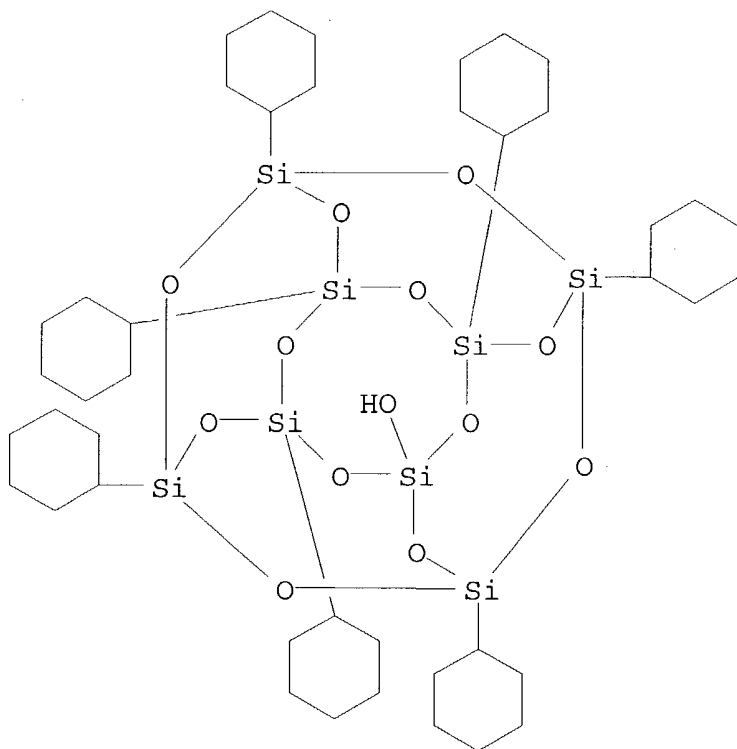
RN 221326-46-1 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octakis(2-methylpropyl)- (9CI) (CA INDEX NAME)



RN 230316-14-0 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanol, heptacyclohexyl- (9CI) (CA INDEX NAME)



- CC 29-6 (Organometallic and Organometalloidal Compounds)
Section cross-reference(s): 75
- IT Silsesquioxanes
(incompletely condensed; prepn. of incompletely condensed silsesquioxanes by base-mediated cleavage of **polyhedral oligosilsesquioxanes**)
- IT 3809-28-7 3809-29-8 17865-85-9
221326-46-1 230316-14-0
(base-mediated cleavage of **polyhedral oligosilsesquioxanes**)
- IT 204719-35-7P 255062-75-0P 255062-76-1P 255062-77-2P
(base-mediated cleavage of **polyhedral oligosilsesquioxanes**)
- IT 255062-79-4P
(crystal structure; prepn. of incompletely condensed silsesquioxanes by base-mediated cleavage of **polyhedral oligosilsesquioxanes**)
- IT 4115-83-7P 255062-80-7P
(prepn. of incompletely condensed silsesquioxanes by base-mediated cleavage of **polyhedral oligosilsesquioxanes**)
- L46 ANSWER 14 OF 24 HCA COPYRIGHT 2003 ACS on STN
131:144926 **Polyhedral oligosilsesquioxanes**
(POSS)-building blocks for the development of nano-structured

materials. Lucke, S.; Stoppek-Langner, K. (Anorganisch-Chemisches Institut, Westfälische Wilhelms Universität Münster, Münster, 48149, Germany). Applied Surface Science, 144-145, 713-715 (English) 1999. CODEN: ASUSEE. ISSN: 0169-4332. Publisher: Elsevier Science B.V..

AB As a more rapid and versatile synthetic approach, we have studied the FeCl₃-catalyzed hydrolytic polycondensation of suitable trichlorsilanes in a biphasic system which yields the new octasilsesquioxane (BrCH₂CH₂CH₂)₈Si₈O₁₂.

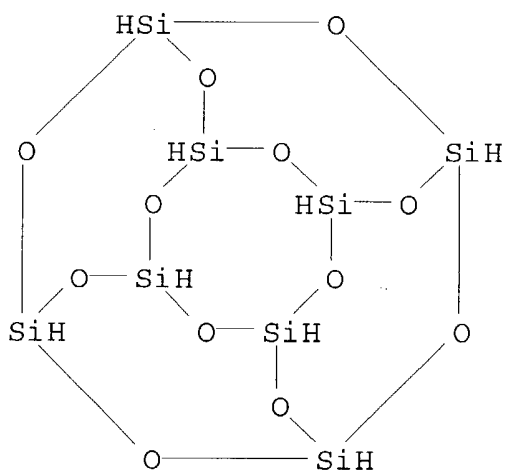
IT 281-50-5P 195322-96-4P 235741-57-8P

(prepn. of polyhedral oligosilsesquioxanes in

presence of ferric chloride catalyst and subsequent modification)

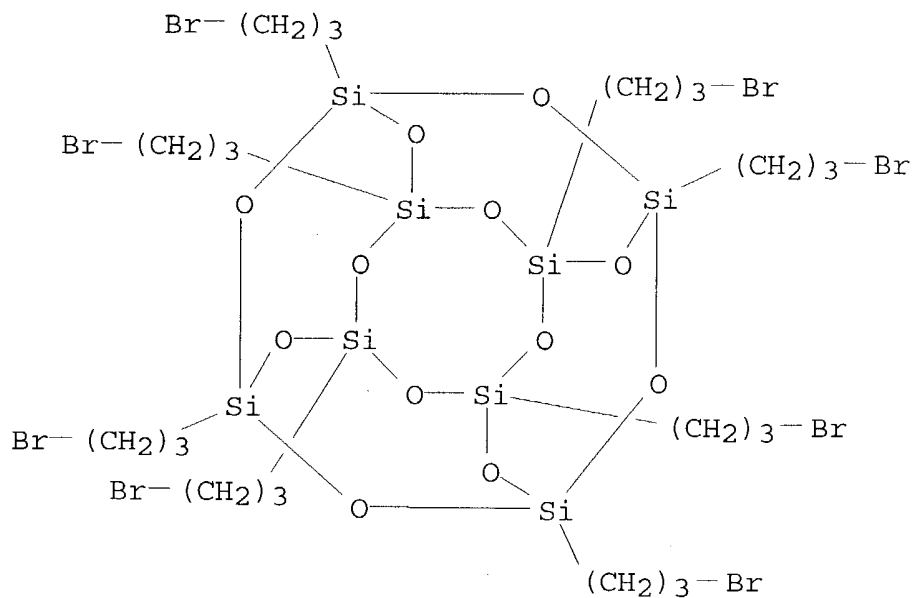
RN 281-50-5 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane (6CI, 8CI, 9CI) (CA INDEX NAME)



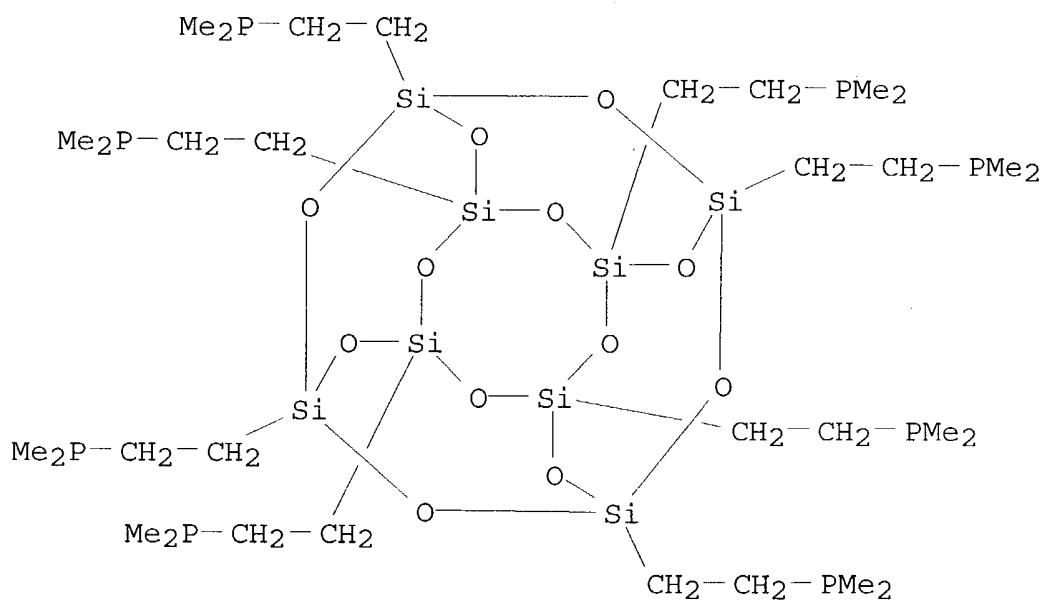
RN 195322-96-4 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octakis(3-bromopropyl)- (9CI) (CA INDEX NAME)



RN 235741-57-8 HCA

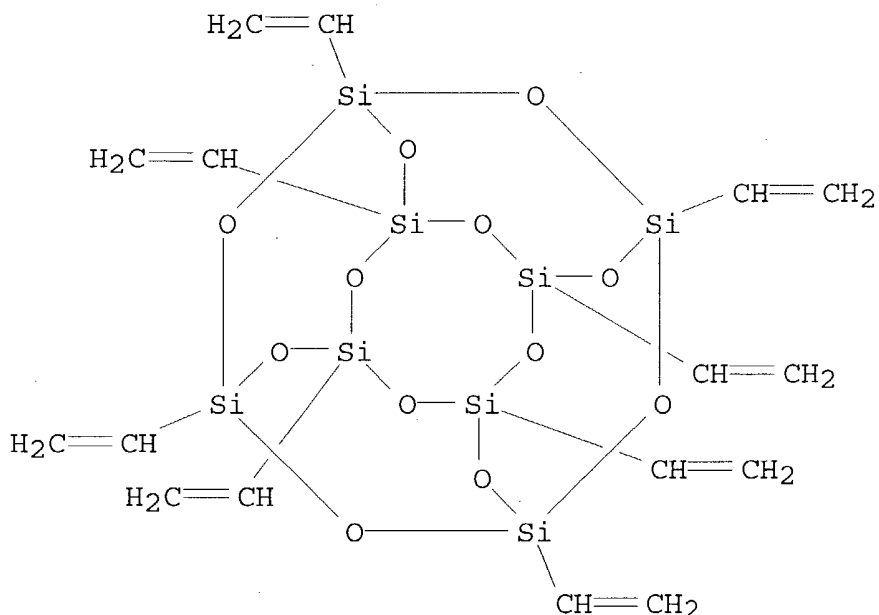
CN Phosphine, (pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane-1,3,5,7,9,11,13,15-octaylocta-2,1-ethanediyl)octakis[dimethyl- (9CI)
(CA INDEX NAME)



IT 69655-76-1

(reaction with dimethylphosphine; prepn. of **polyhedral oligosilsesquioxanes** in presence of ferric chloride catalyst and subsequent modification)

RN 69655-76-1 HCA
 CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octaethenyl- (9CI)
 (CA INDEX NAME)



CC 35-5 (Chemistry of Synthetic High Polymers)
 IT Silsesquioxanes
 (oligomeric; prepn. of **polyhedral oligosilsesquioxanes** in presence of ferric chloride catalyst and subsequent modification)
 IT Polymerization catalysts
 (oligomerization, ferric chloride; prepn. of **polyhedral oligosilsesquioxanes** in presence of ferric chloride catalyst and subsequent modification)
 IT Polymerization
 (oligomerization; prepn. of **polyhedral oligosilsesquioxanes** in presence of ferric chloride catalyst and subsequent modification)
 IT Crosslinking
 (prepn. of **polyhedral oligosilsesquioxanes** in presence of ferric chloride catalyst and subsequent modification)
 IT 10025-78-2, Trichlorosilane
 (oligomerization of; prepn. of **polyhedral oligosilsesquioxanes** in presence of ferric chloride catalyst and subsequent modification)
 IT 7705-08-0, Iron chloride (FeCl₃), uses
 (prepn. of **polyhedral oligosilsesquioxanes** in presence of ferric chloride catalyst and subsequent modification)
 IT 281-50-5P 195322-96-4P 235741-57-8P
 (prepn. of **polyhedral oligosilsesquioxanes** in presence of ferric chloride catalyst and subsequent modification)

IT 69655-76-1

(reaction with dimethylphosphine; prepn. of **polyhedral oligosilsesquioxanes** in presence of ferric chloride catalyst and subsequent modification)

IT 676-59-5, Dimethylphosphine

(reaction with octavinylloctasilsesquioxane; prepn. of **polyhedral oligosilsesquioxanes** in presence of ferric chloride catalyst and subsequent modification)

L46 ANSWER 15 OF 24 HCA COPYRIGHT 2003 ACS on STN

131:87948 Syntheses of highly functionalized cube-octameric **polyhedral oligosilsesquioxanes** (R₈Si₈O₁₂).

Feher, Frank J.; Wyndham, Kevin D.; Soulivong, Daravong; Nguyen, Frank (Department of Chemistry, University of California, Irvine, CA, 92697-2025, USA). Journal of the Chemical Society, Dalton Transactions: Inorganic Chemistry (9), 1491-1498 (English) 1999. CODEN: JCDBTBI. ISSN: 0300-9246. OTHER SOURCES: CASREACT 131:87948. Publisher: Royal Society of Chemistry.

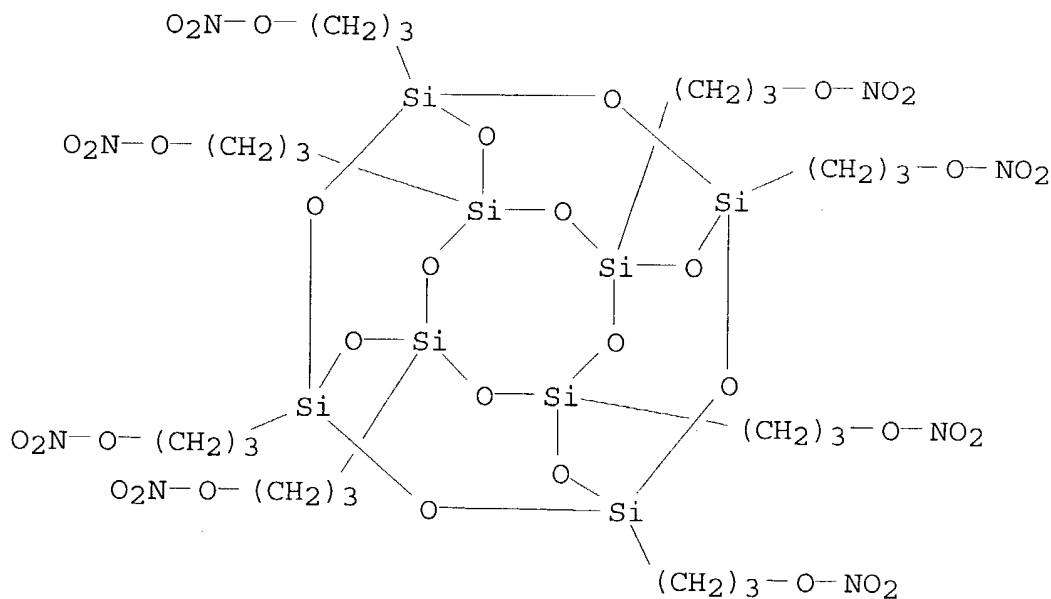
AB Reactions of [H₂N(CH₂)₃]₈Si₈O₁₂ or its octahydrochloride salt with a variety of electrophiles, including anhydrides, lactones, acid chlorides, .alpha.,.beta.-unsatd. esters and isocyanates, afforded functionalized R₈Si₈O₁₂ frameworks in good to excellent yields. Practical methods for the synthesis of [HO(CH₂)₃]₈Si₈O₁₂, [OCN(CH₂)₃]₈Si₈O₁₂ and [(Ph₂PCH₂)₂N(CH₂)₃]₈Si₈O₁₂ are also reported.

IT 226726-52-9P

(prepn. and hydrogenolysis of)

RN 226726-52-9 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxaneoctapropanol, octanitrate (9CI) (CA INDEX NAME)

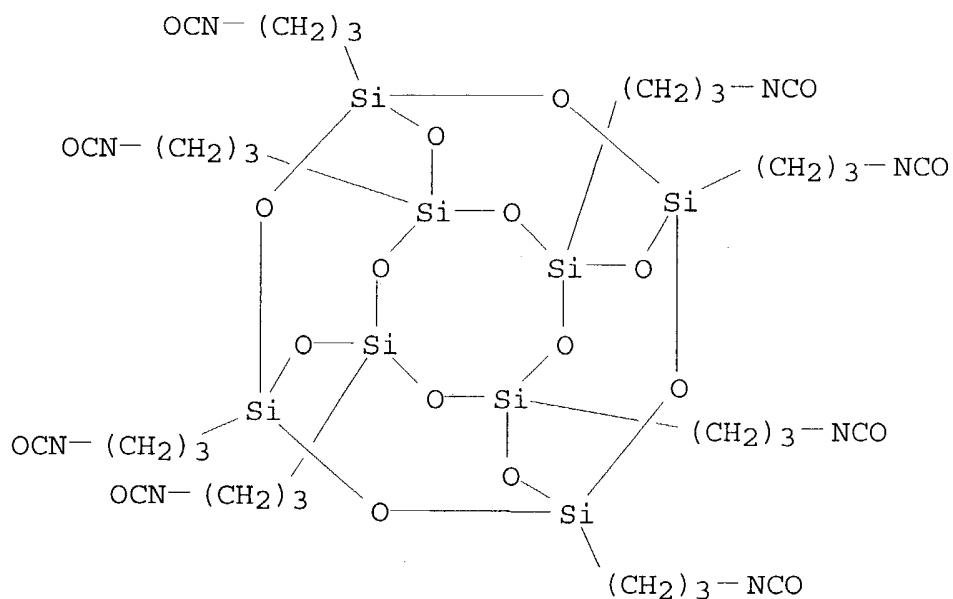


IT 229967-90-2P

(prepn. and reaction with butylamine)

RN 229967-90-2 HCA

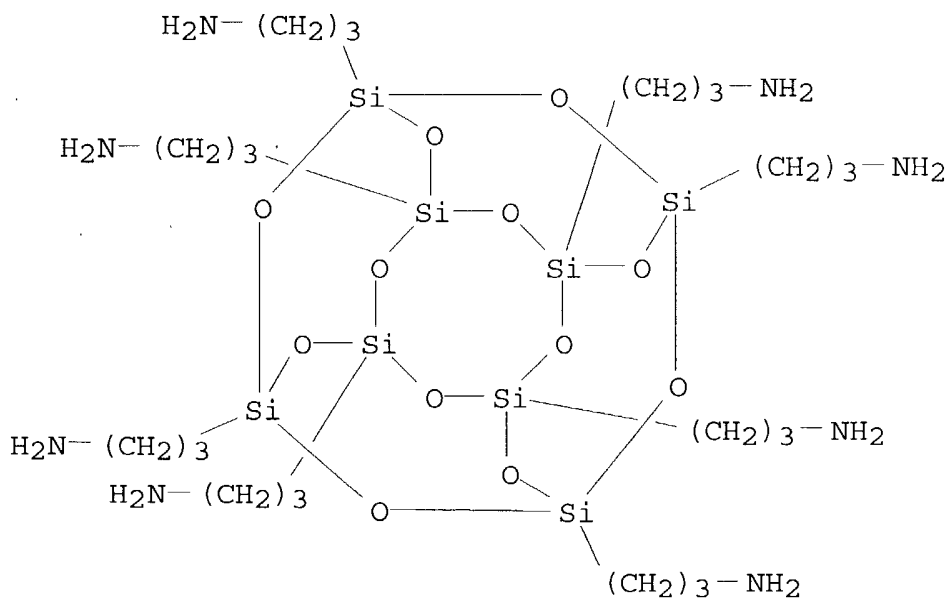
CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octakis(3-isocyanatopropyl)- (9CI) (CA INDEX NAME)



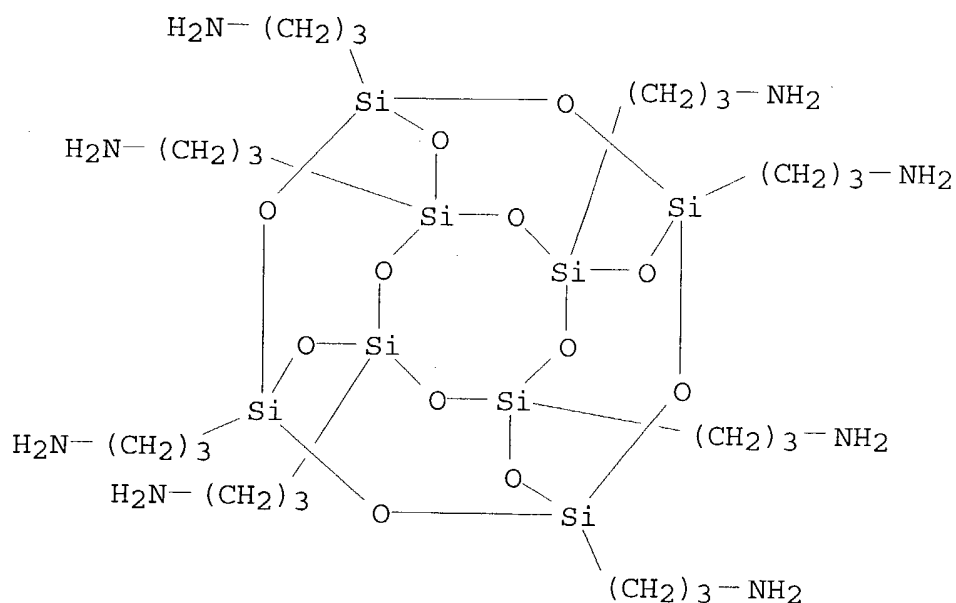
IT 150380-11-3P 203256-25-1P

(prepn. and reaction with electrophiles)

RN 150380-11-3 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxaneoctapropanamine (9CI)
(CA INDEX NAME)

RN	203256-25-1	HCA
CN	Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxaneoctapropanamine, octahydrochloride (9CI) (CA INDEX NAME)	

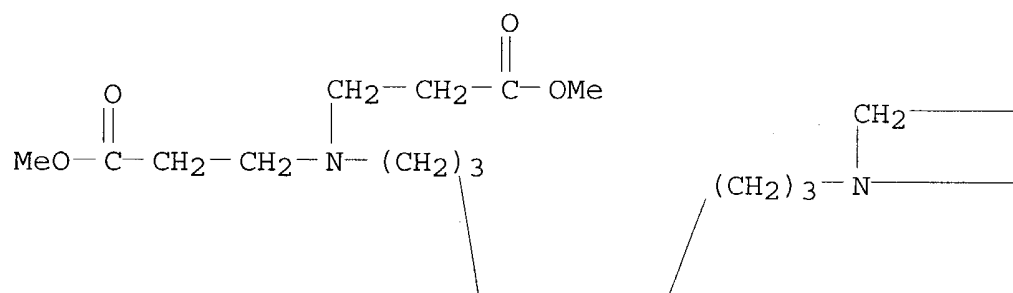


● 8 HCl

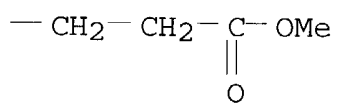
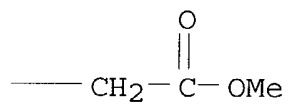
IT 203256-30-8P 219534-88-0P 219534-89-1P
 229967-81-1P 229967-83-3P 229967-84-4P
 229967-85-5P 229967-86-6P 229967-87-7P
 229967-88-8P 229967-89-9P 229967-91-3P
 (prepn. of)

RN	203256-30-8 HCA
CN	.beta.-Alanine, N,N',N'',N''',N'''',N''''',N''''',N''''',N''''', (pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane-1,3,5,7,9,11,13,15- octaylocta-3,1-propanediyl)octakis[N-(3-methoxy-3-oxopropyl)-, octamethyl ester (9CI) (CA INDEX NAME)

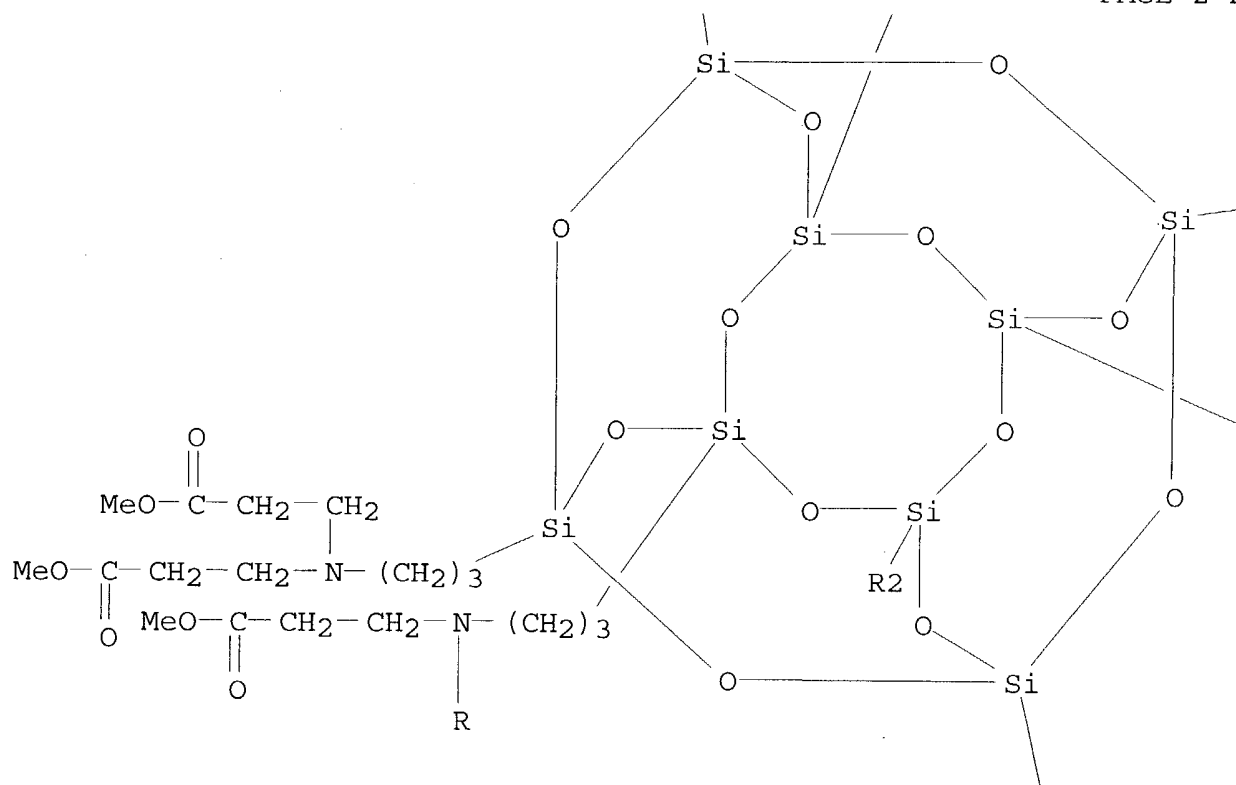
PAGE 1-A



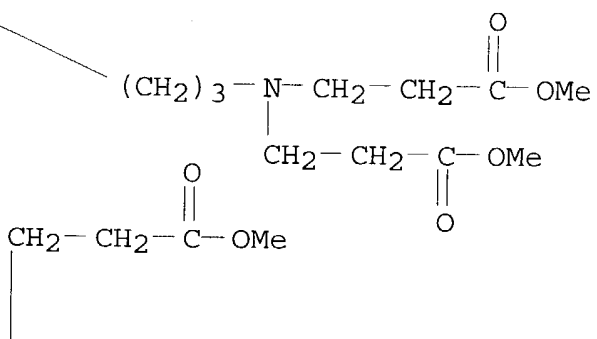
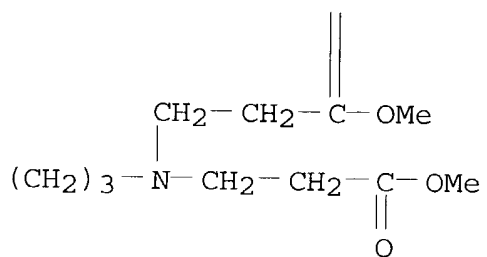
PAGE 1-B



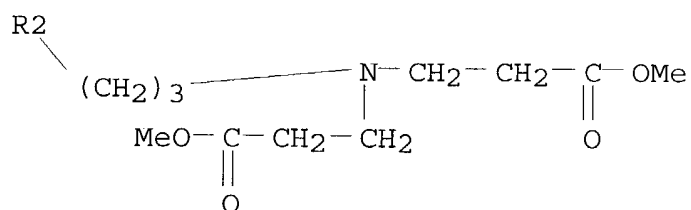
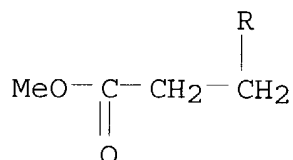
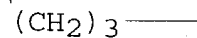
PAGE 2-A



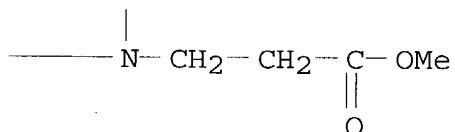
PAGE 2-B



PAGE 3-A

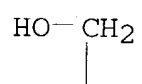


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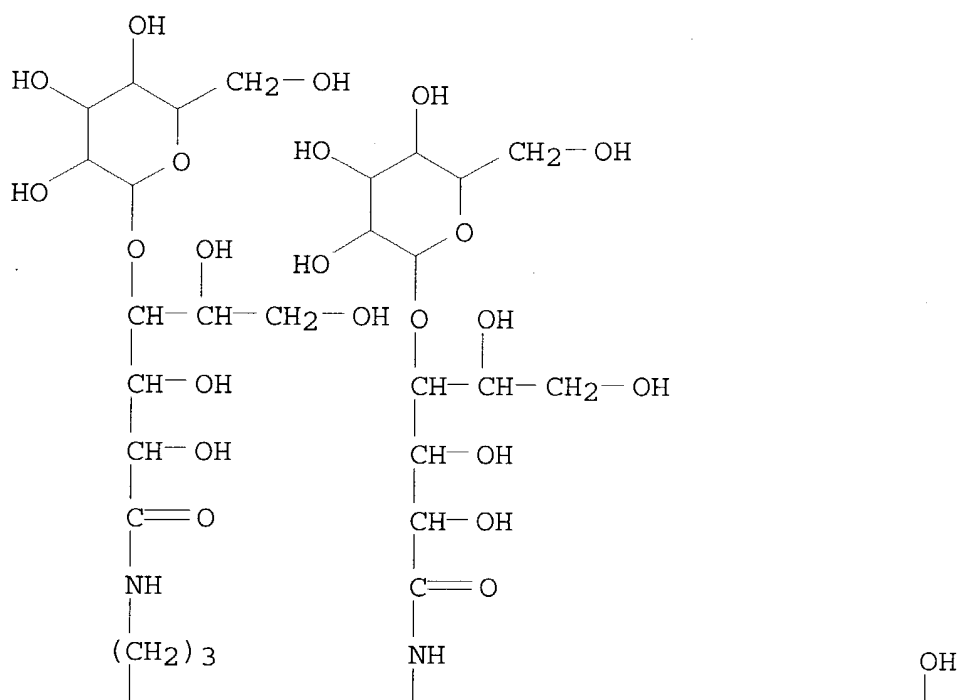


RN	219534-88-0 HCA
CN	D-Gluconamide, N,N',N'',N''',N'''',N''''',N''''',N''''''',N'''''''''- (pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane-1,3,5,7,9,11,13,15- octaylocta-3,1-propanediyl)octakis[4-O-.beta.-D-galactopyranosyl- (9CI) (CA INDEX NAME)

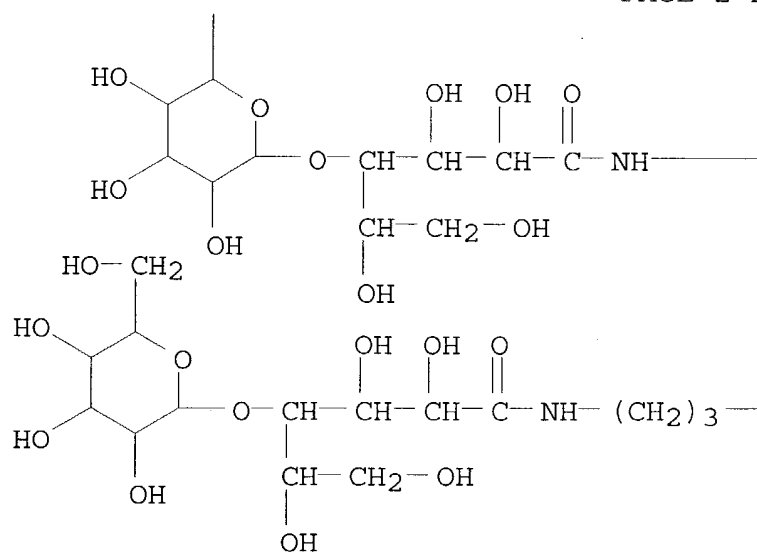
PAGE 1-A



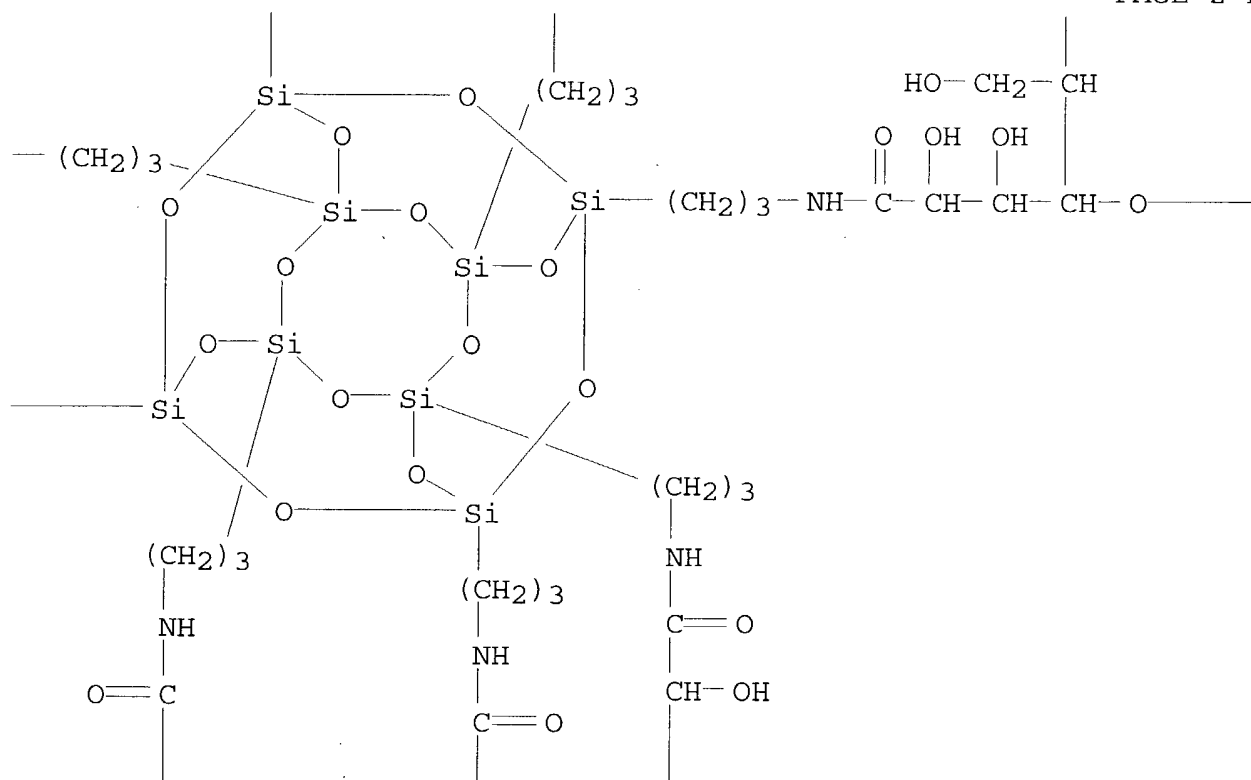
PAGE 1-B



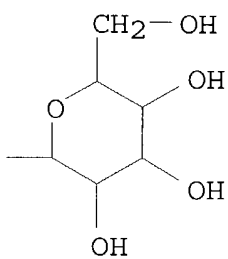
PAGE 2-A



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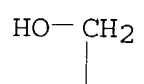
PAGE 2-C



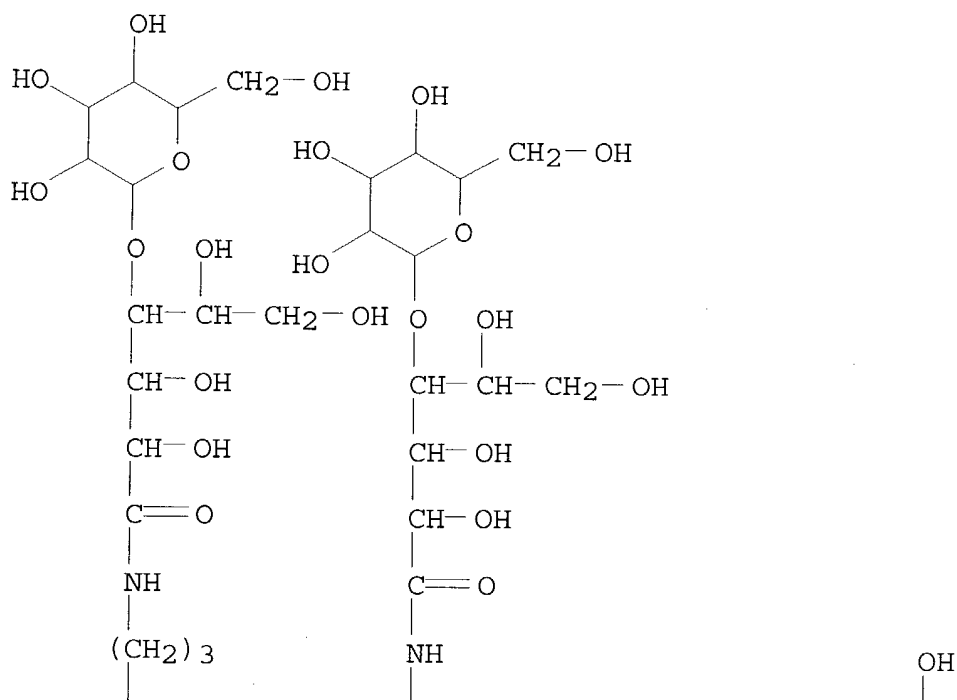
$$\text{HO}-\text{CH}_2-$$
$$\text{HO}-\text{CH}_2-$$
[illegible]

RN	219534-89-1 HCA
CN	D-Gluconamide, N,N',N'',N''',N'''',N''''',N'''''',N''''''' - (pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane-1,3,5,7,9,11,13,15- octaylocta-3,1-propanediyl) octakis[4-O-.alpha.-D-glucopyranosyl- (9CI) (CA INDEX NAME)

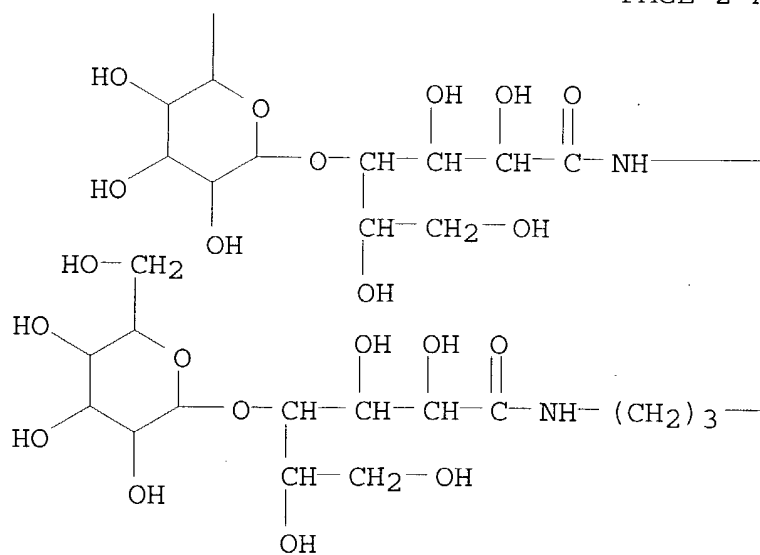
PAGE 1-A



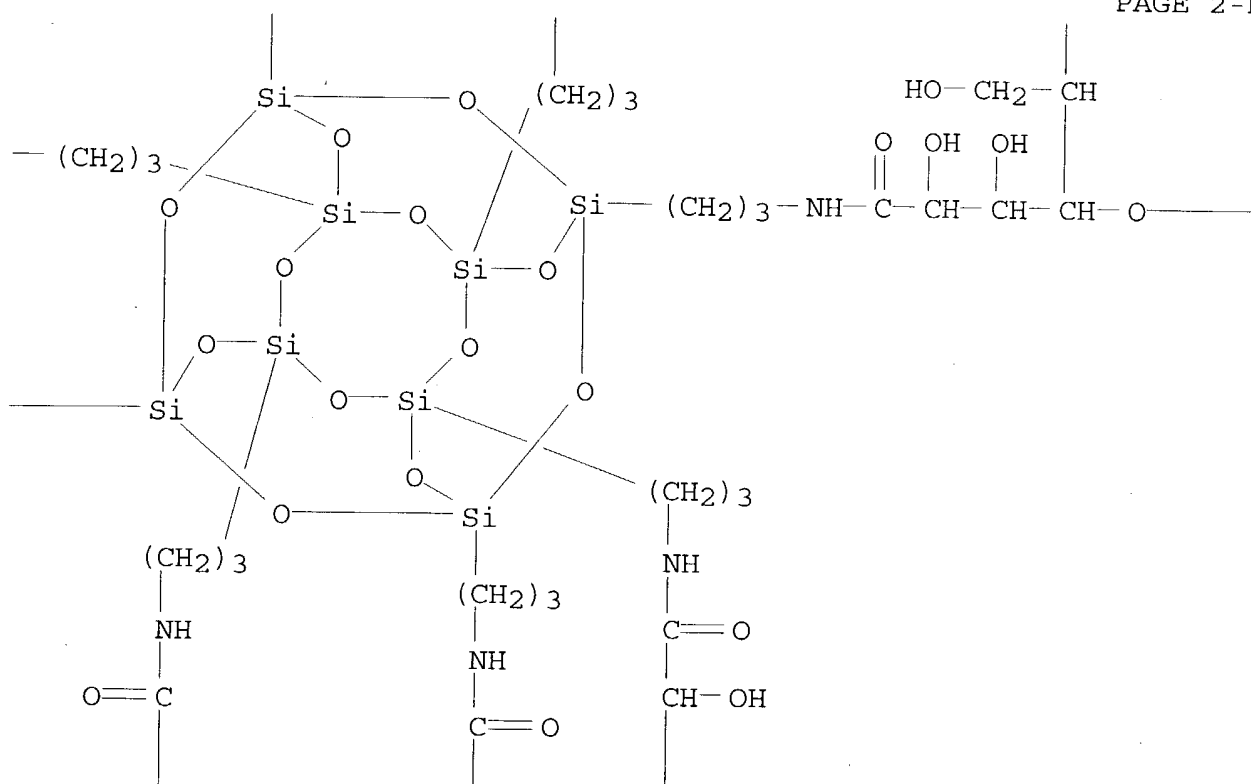
PAGE 1-B



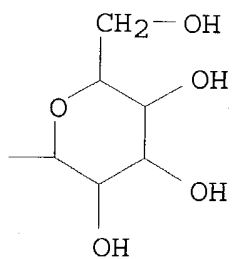
PAGE 2-A



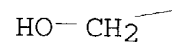
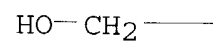
PAGE 2-B



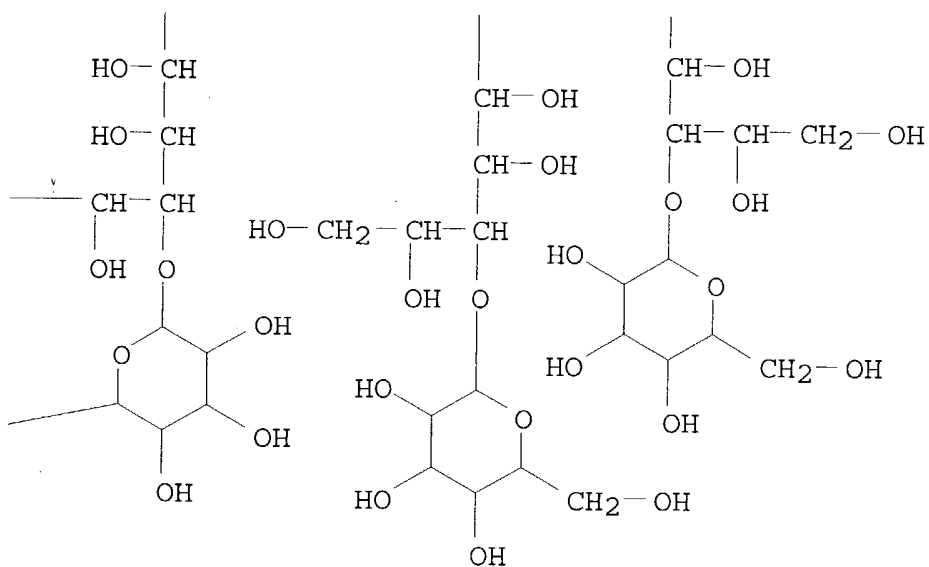
PAGE 2-C



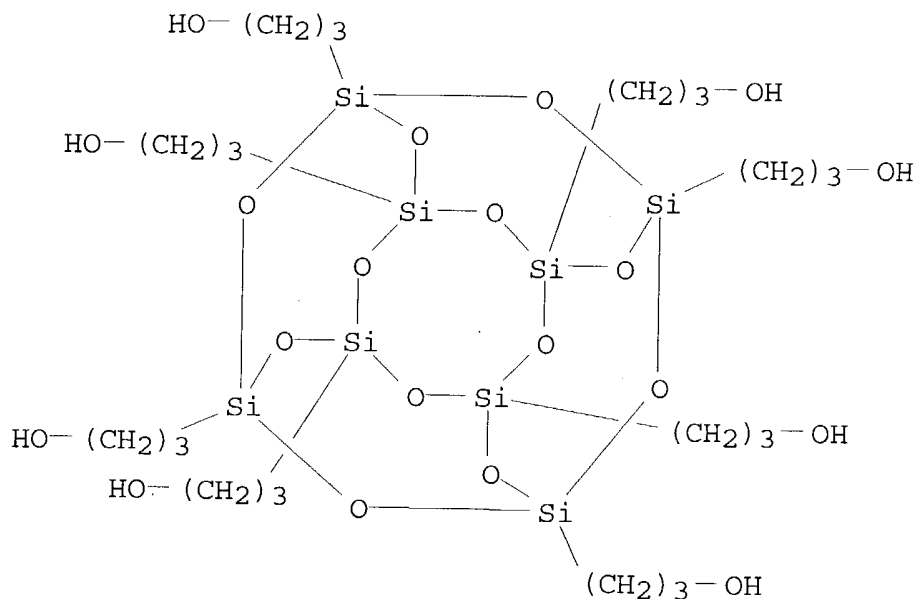
PAGE 3-A



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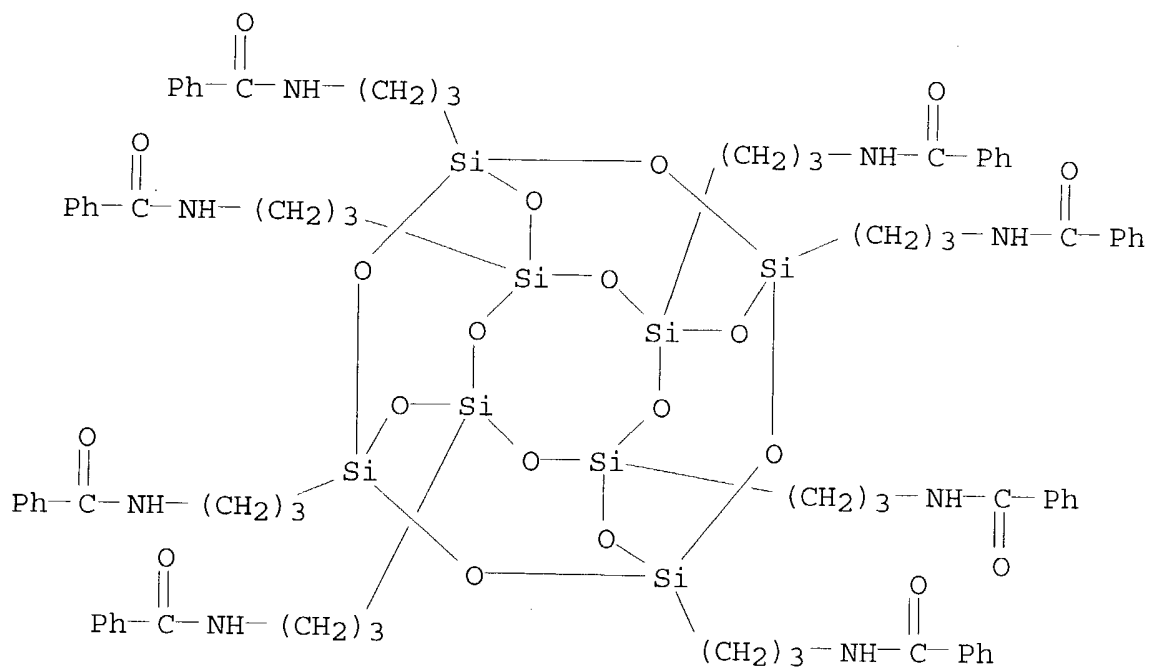


RN 229967-81-1 HCA
 CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxaneoctapropanol (9CI)
 (CA INDEX NAME)



RN 229967-83-3 HCA

CN Benzamide, N,N',N'',N''',N'''',N''''',N'''''',N'''''''-
 (pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane-1,3,5,7,9,11,13,15-
 octaylocta-3,1-propanediyl)octakis- (9CI) (CA INDEX NAME)

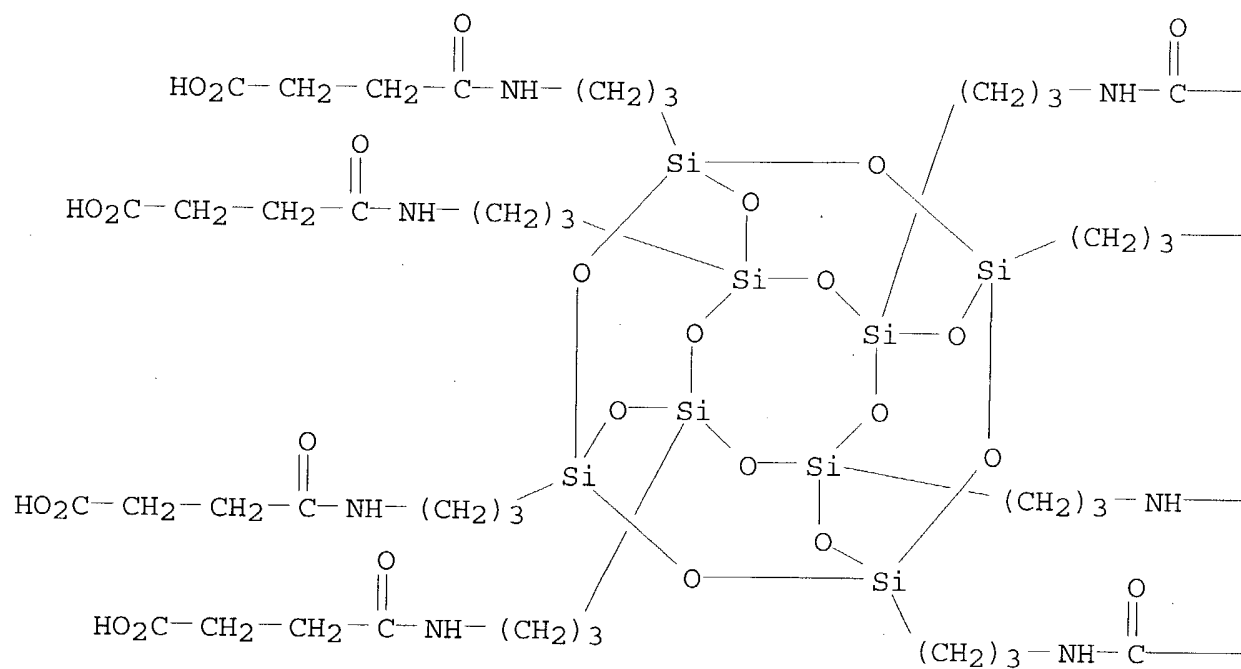


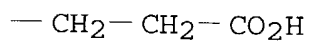
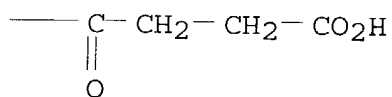
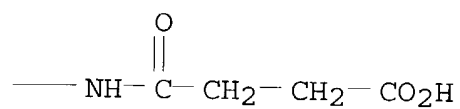
RN 229967-84-4 HCA

CN Butanoic acid, 4,4',4'',4''',4'''',4''''' ,4'''''' ,4''''''' -

[pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane-1,3,5,7,9,11,13,15-octayloctakis(3,1-propanediylimino)]octakis[4-oxo- (9CI) (CA INDEX NAME)]

PAGE 1-A

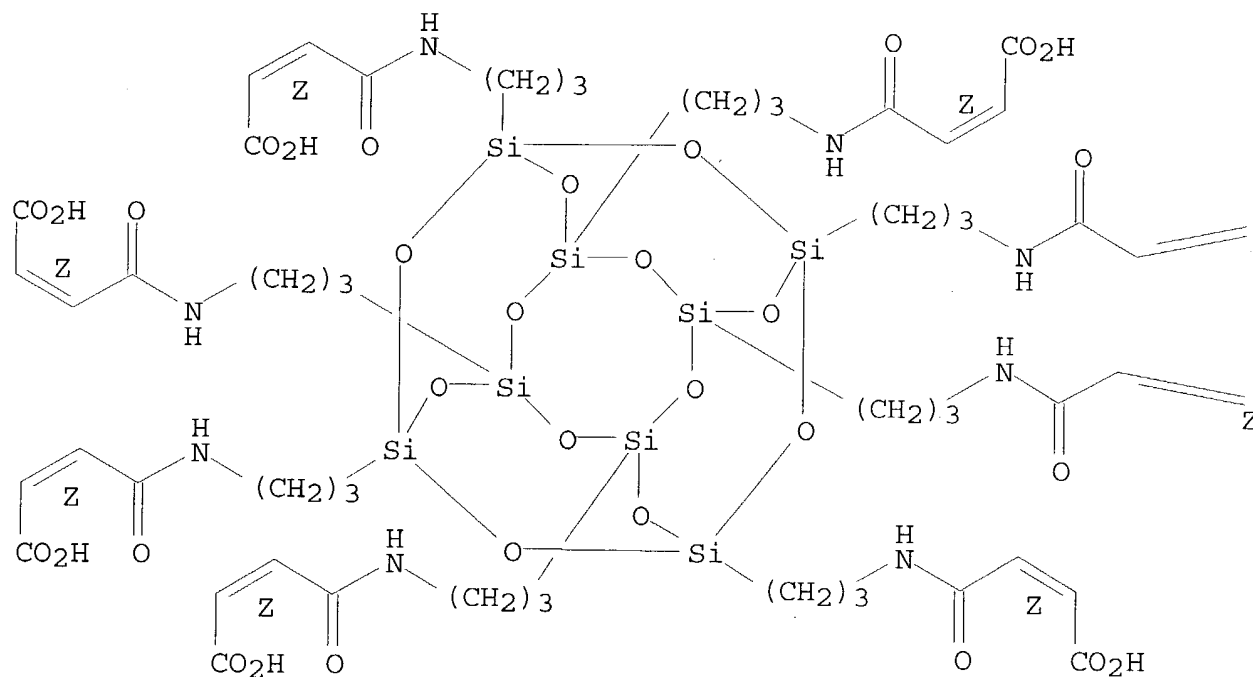


$$\text{---CH}_2\text{---CH}_2\text{---CO}_2\text{H}$$


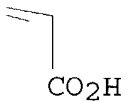
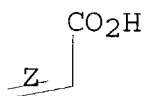
RN	229967-85-5	HCA
CN	2-Butenoic acid, 4,4',4'',4''',4'''',4''''',4''''',4''''',4''''', [pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane-1,3,5,7,9,11,13,15- octayloctakis(3,1-propanediylimino)]octakis[4-oxo-, (2Z,2'Z,2''Z,2'''Z,2''''Z,2'''''Z,2''''''Z,2''''''Z)- (9CI) (CA INDEX NAME)	

Double bond geometry as shown.

PAGE 1-A

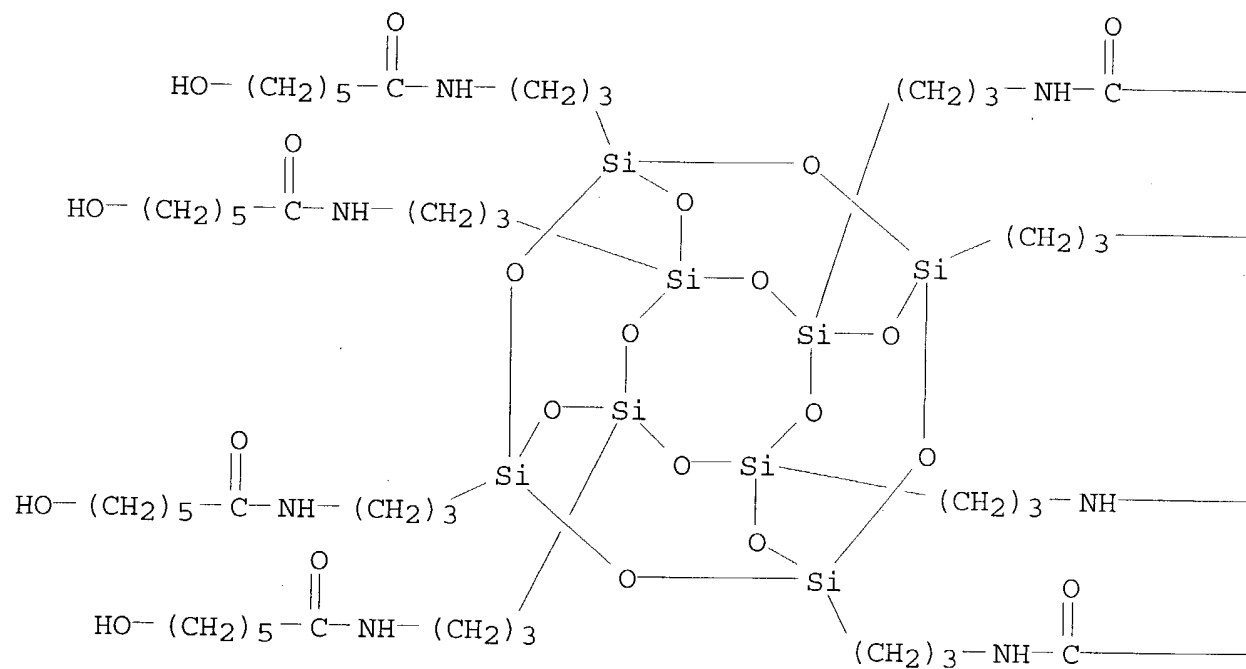


PAGE 1-B

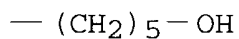
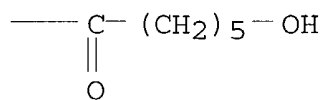
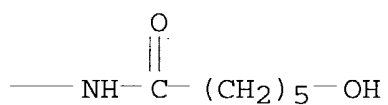
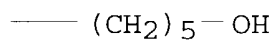


RN	229967-86-6	HCA
CN	Hexanamide, N,N',N'',N''',N'''',N''''',N''''',N'''''- (pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane-1,3,5,7,9,11,13,15- octaylocta-3,1-propanediyl)octakis[6-hydroxy- (9CI) (CA INDEX NAME)	

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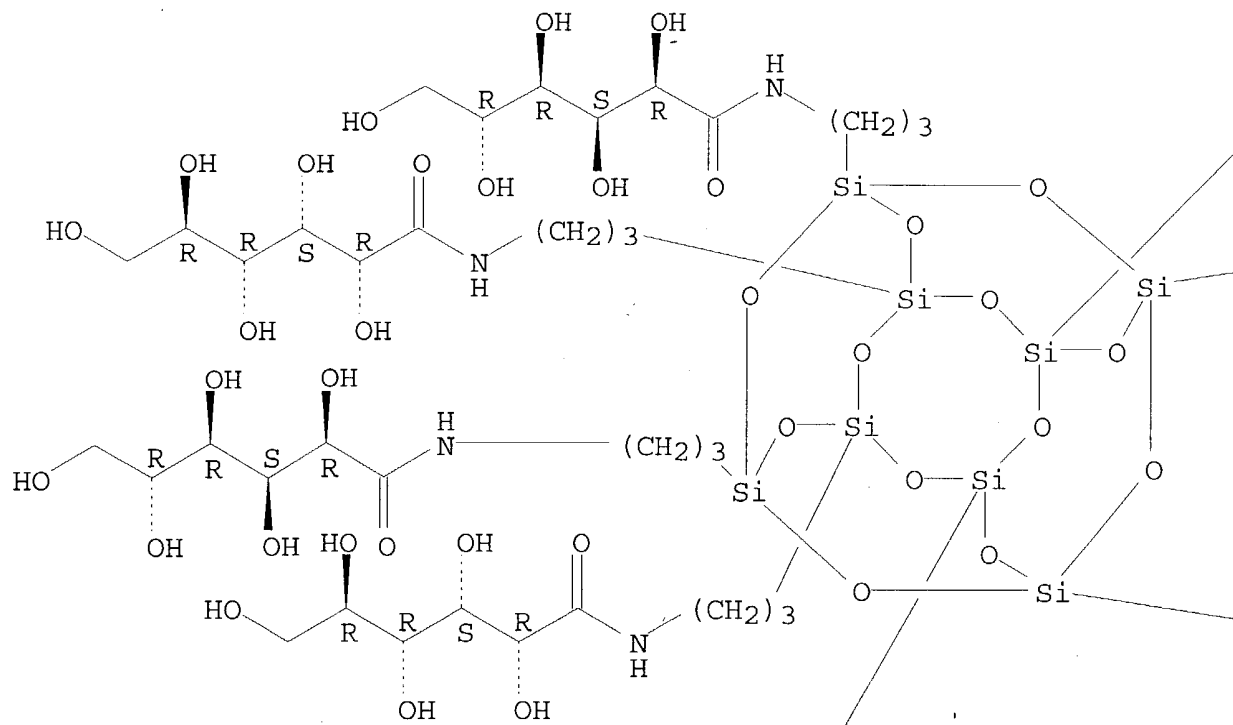


RN 229967-87-7 HCA

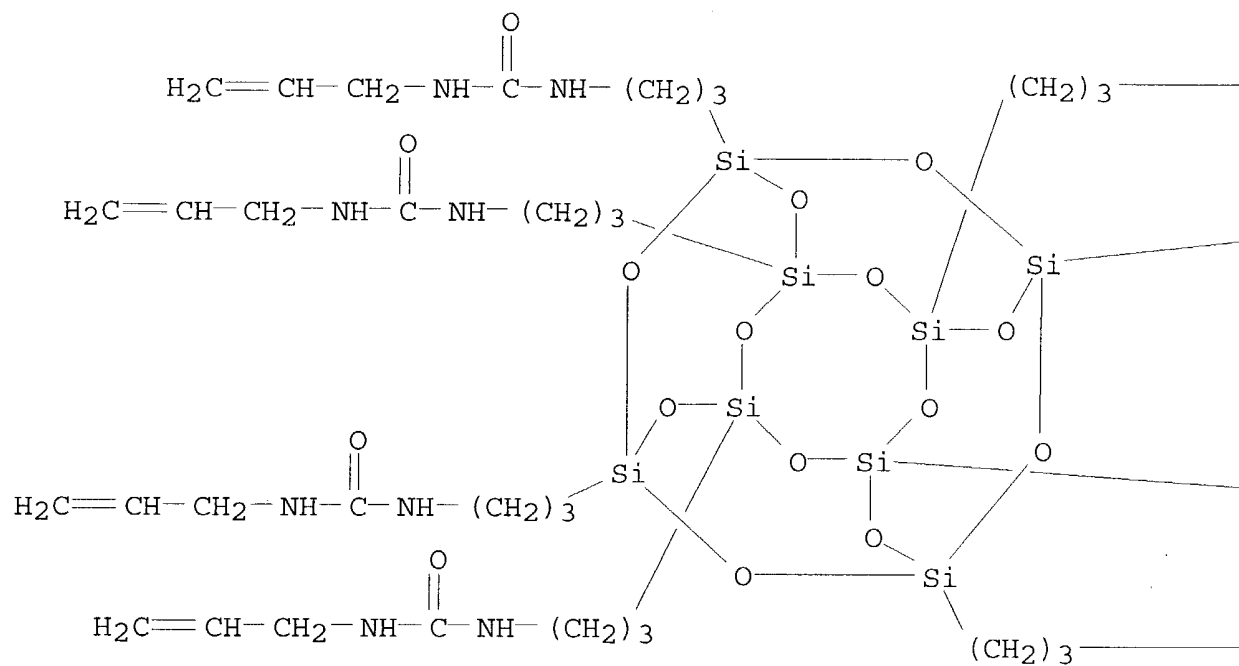
CN D-Gluconamide, N,N',N'',N''',N'''',N''''',N''''',N''''''-
 (pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane-1,3,5,7,9,11,13,15-
 octaylocta-3,1-propanediyl)octakis- (9CI) (CA INDEX NAME)

Absolute stereochemistry.

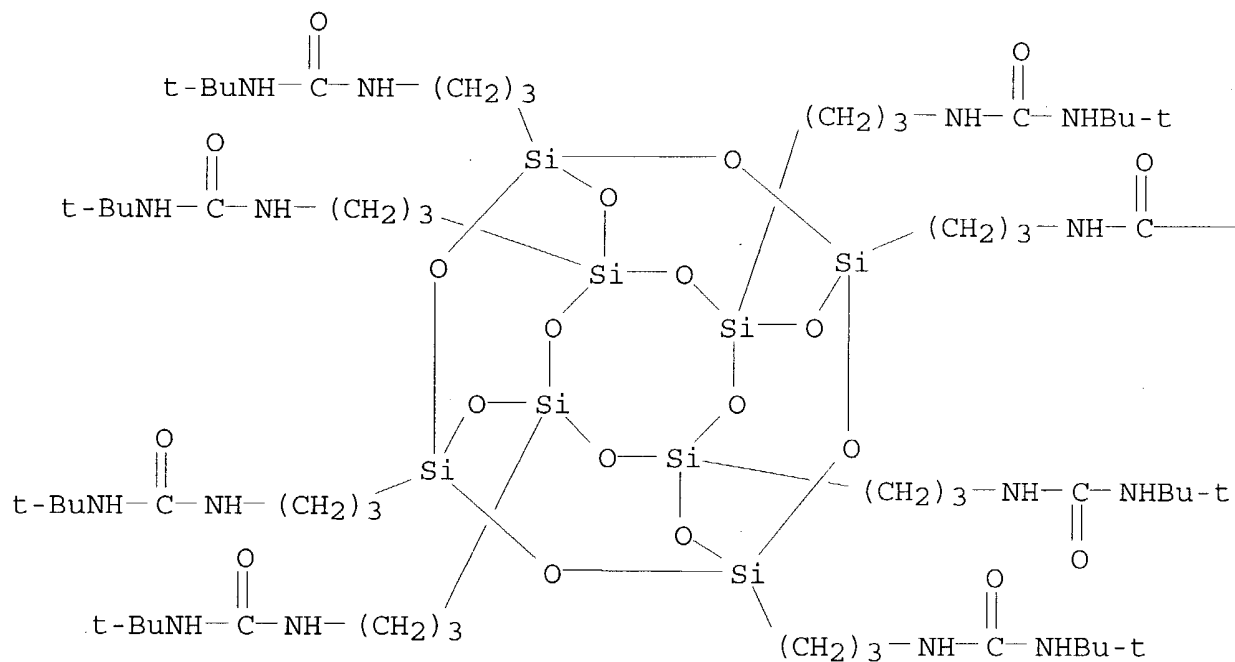
PAGE 1-A



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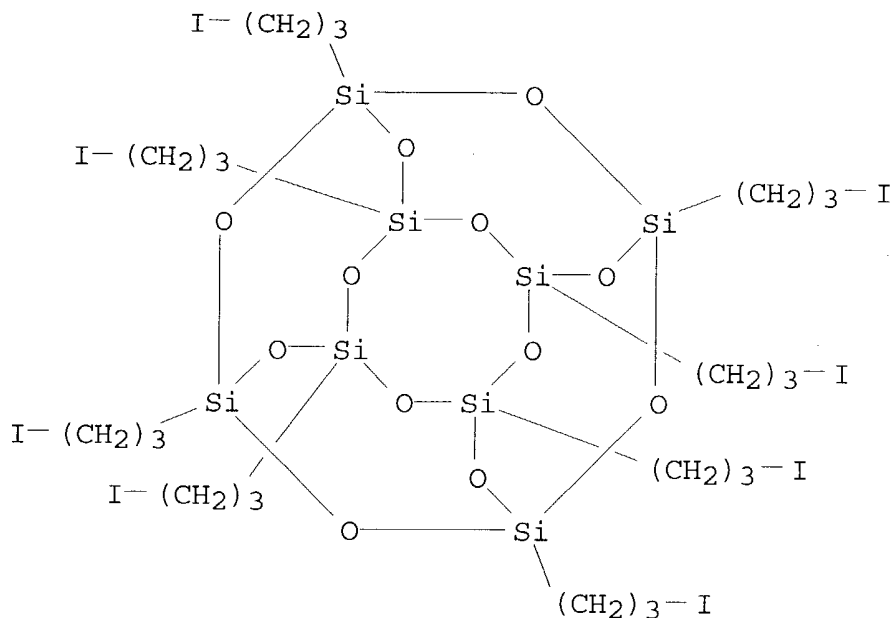
—NHBu-t

IT 161678-43-9

(reaction with silver nitrate)

RN 161678-43-9 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octakis(3-iodopropyl)-(9CI) (CA INDEX NAME)



CC 29-6 (Organometallic and Organometalloidal Compounds)

Section cross-reference(s): 33, 37

ST functionalized cube octameric **polyhedral oligo silsesquioxane** deriv prepn; aminoalkyl octameric **polyhedral oligosilsesquioxane** prepn reaction

IT Silsesquioxanes

(syntheses of highly functionalized cube-octameric **polyhedral oligosilsesquioxanes**)

IT 226726-52-9P

(prepn. and hydrogenolysis of)

IT 229967-90-2P

(prepn. and reaction with butylamine)

IT 150380-11-3P 203256-25-1P

(prepn. and reaction with electrophiles)

IT 203256-30-8P 219534-88-0P 219534-89-1P

229967-81-1P 229967-82-2P 229967-83-3P

229967-84-4P 229967-85-5P 229967-86-6P

229967-87-7P 229967-88-8P 229967-89-9P

229967-91-3P 230283-76-8P 230283-78-0P

(prepn. of)

IT 98-88-4, Benzoyl chloride

(reaction with aminoalkyl octameric **polyhedral oligosilsesquioxane**)

IT 161678-43-9

(reaction with silver nitrate)

IT 75-44-5, Phosgene 90-80-2, .delta.-Gluconolactone 96-33-3,

Methyl acrylate 108-30-5, reactions 108-31-6, 2,5-Furandione,

reactions 111-36-4, Butyl isocyanate 502-44-3, 2-Oxepanone

829-85-6, Diphenylphosphine 919-30-2 1476-23-9, Allyl isocyanate

5965-65-1, .delta.-Lactonolactone 42776-28-3
(syntheses of highly functionalized cube-octameric
polyhedral oligosilsesquioxanes)

L46 ANSWER 16 OF 24 HCA COPYRIGHT 2003 ACS on STN

131:19097 Mass spectrometric characterization of **polyhedral oligosilsesquioxanes** and heterosilsesquioxanes. Bakhtiar, Ray; Feher, Frank J. (Department of Chemistry and Chemical Biology, Stevens Institute of Technology, Hoboken, NJ, 07030, USA). Rapid Communications in Mass Spectrometry, 13(8), 687-694 (English) 1999. CODEN: RCMSEF. ISSN: 0951-4198. Publisher: John Wiley & Sons Ltd..
AB Silsesquioxanes constitute a diverse range of Si-O frameworks with a wide variety of intriguing possibilities as models for catalysis. These topol. interesting mols. are formed by the hydrolytic condensation of trifunctional organosilanes. Heterosilsesquioxanes are formally derived by substitution of a main-group, transition-metal, or f-element atom for one or more Si atoms in a silsesquioxane. A no. of silsesquioxanes and their metal-contg. derivs., metallasilsesquioxanes (Si-O-M), were characterized using atm. pressure chem. ionization (APCI) and turbo ion-spray (TISP) mass spectrometry. The use of n-hexane or n-hexane/EtOH (90:10, vol./vol.) allowed the techniques to be used to characterize a large no. of complexes. In some cases addn. of trace amts. of ammonium acetate, NaCl, or NaOAc to the EtOH portion of the solvent allowed the detection of [M + NH4]⁺ or [M + Na]⁺ ions.

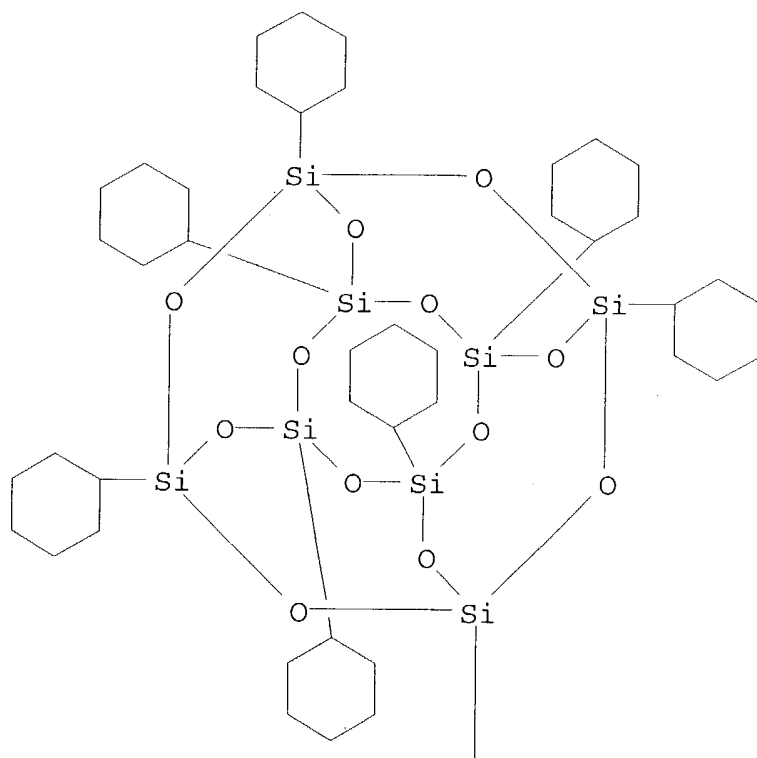
IT 3809-28-7 69655-76-1 161678-38-2
203256-25-1 203256-28-4 226726-51-8
226726-52-9

(mass spectrometric characterization of **polyhedral oligosilsesquioxanes** and heterosilsesquioxanes)

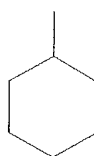
RN 3809-28-7 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octacyclohexyl-
(7CI, 8CI, 9CI) (CA INDEX NAME)

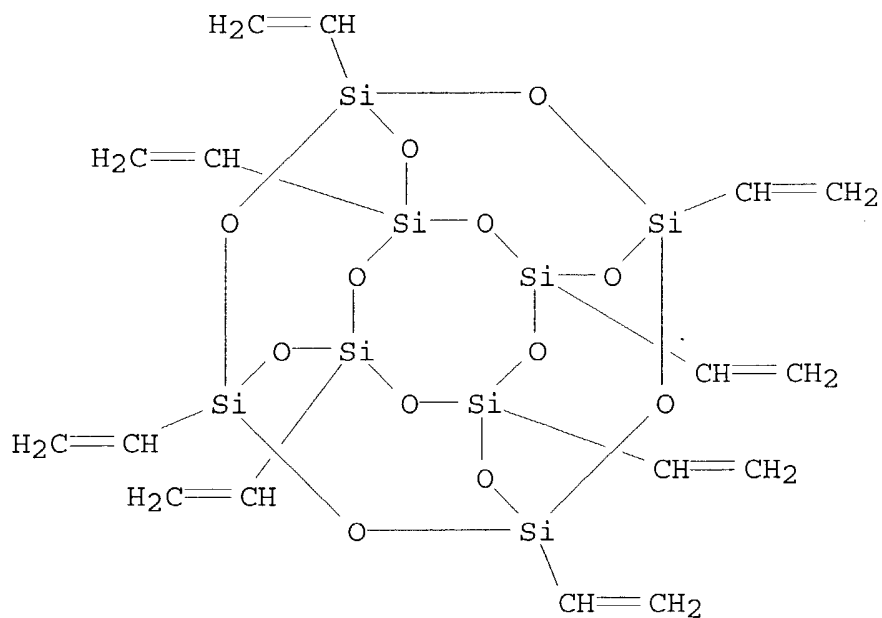
PAGE 1-A



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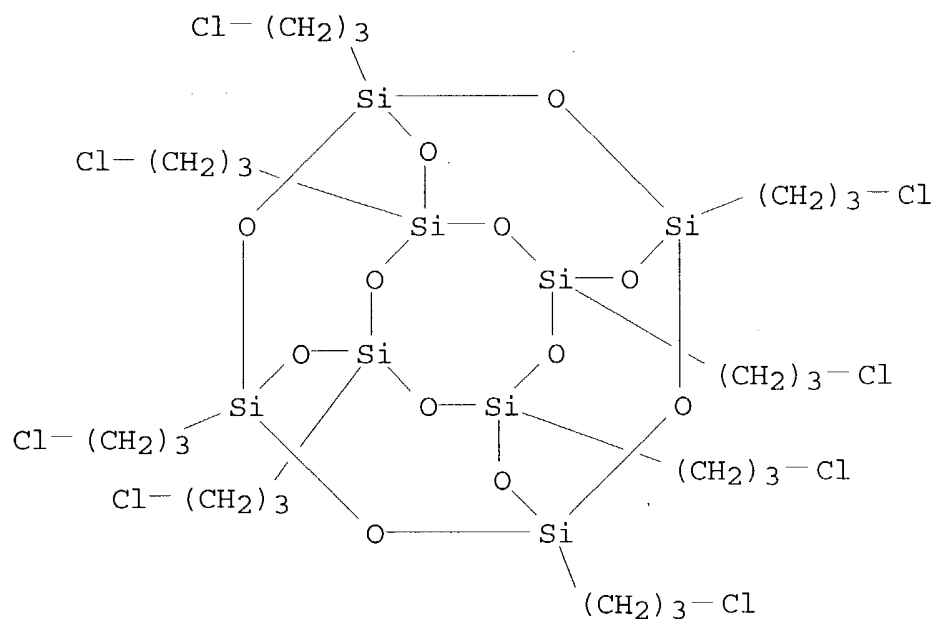


RN 69655-76-1 HCA
 CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octaethenyl- (9CI)
 (CA INDEX NAME)



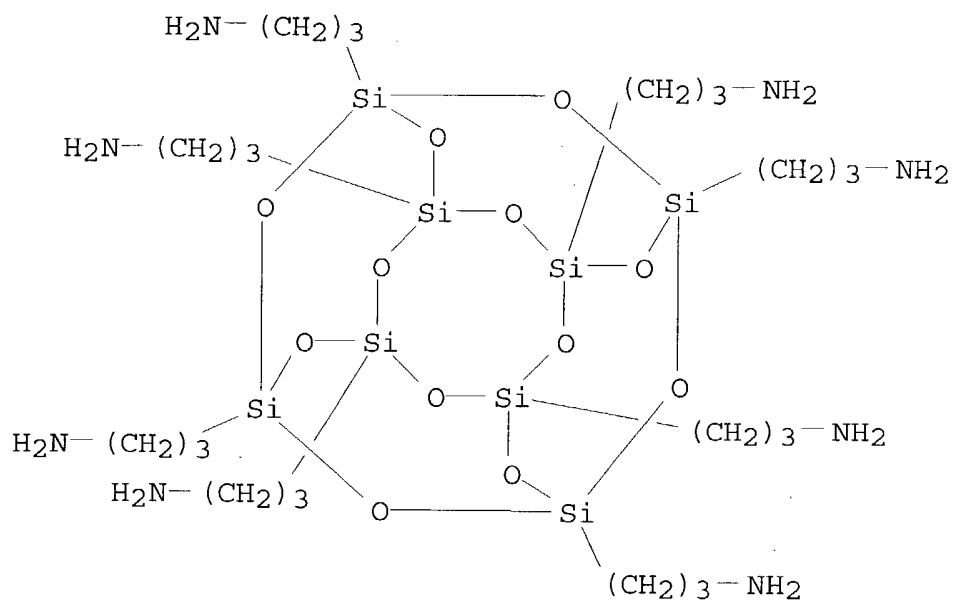
RN 161678-38-2 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octakis(3-chloropropyl)-(9CI) (CA INDEX NAME)



RN 203256-25-1 HCA

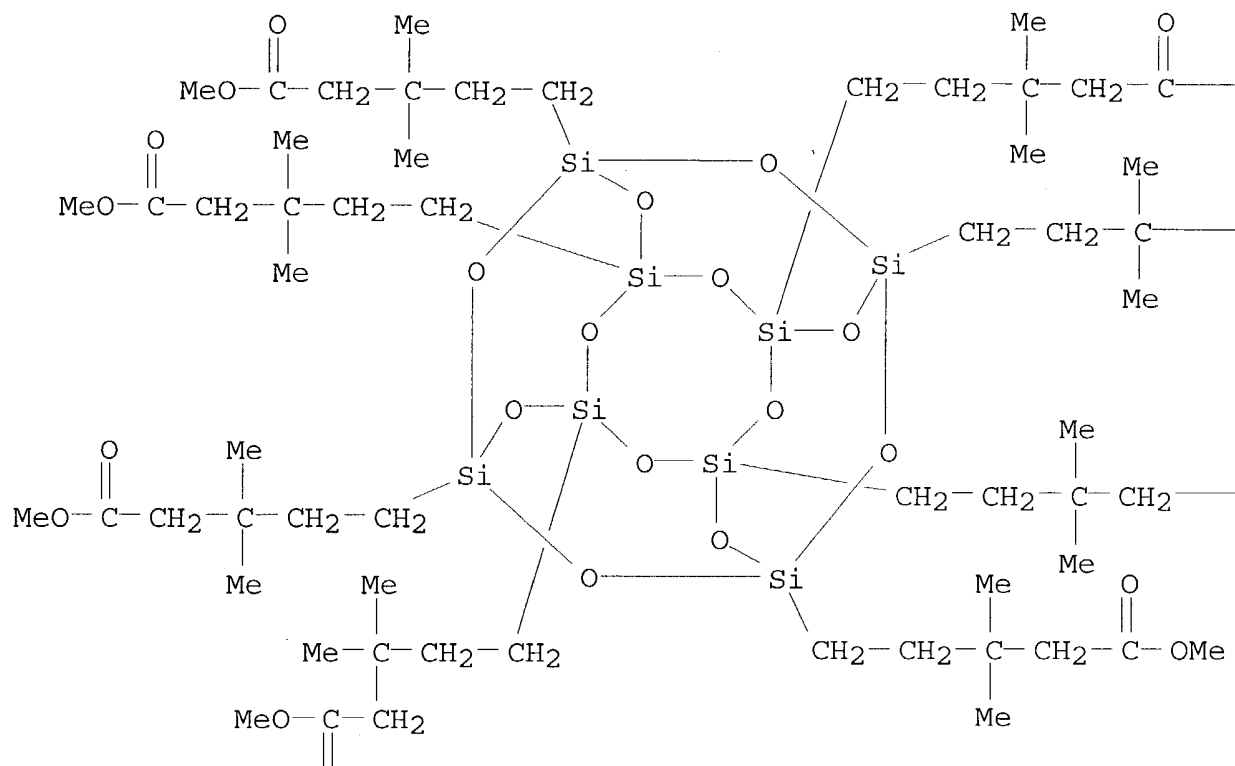
CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxaneoctapropanamine, octahydrochloride (9CI) (CA INDEX NAME)



● 8 HCl

RN 203256-28-4 HCA
 CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxaneoctapentanoic acid,
 .beta.,.beta.,.beta.',.beta.',.beta.',.beta.',.beta.',.beta.',
 .beta.',.beta.',.beta.',.beta.',.beta.',.beta.',.beta.',
 ',.beta.',.beta.',.beta.',.beta.',.beta.',.beta.',
 (9CI) (CA INDEX NAME)

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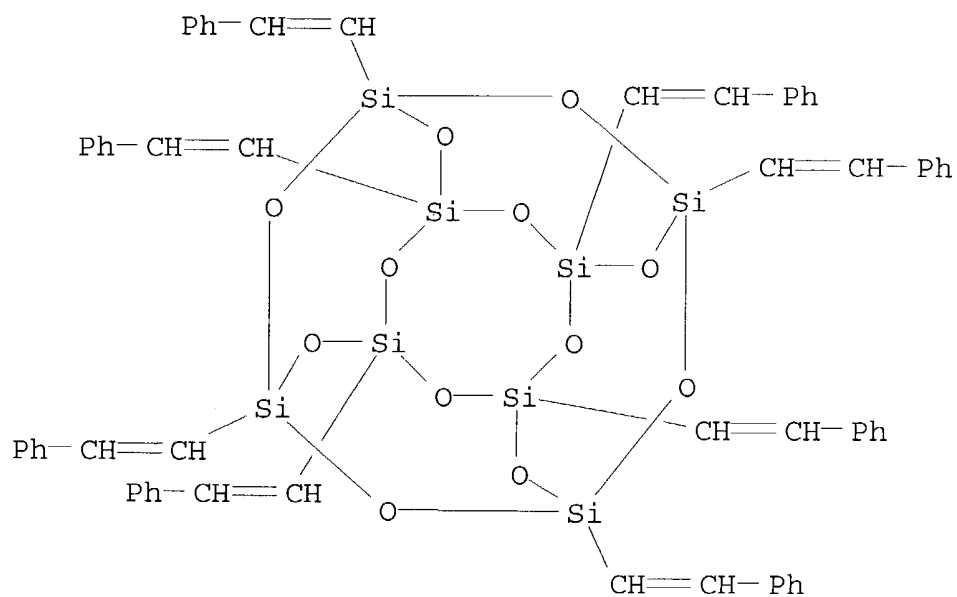
PAGE 1-B

 $-\text{OMe}$ $-\text{CH}_2-\text{C}(=\text{O})\text{OMe}$ $-\text{C}(=\text{O})\text{OMe}$

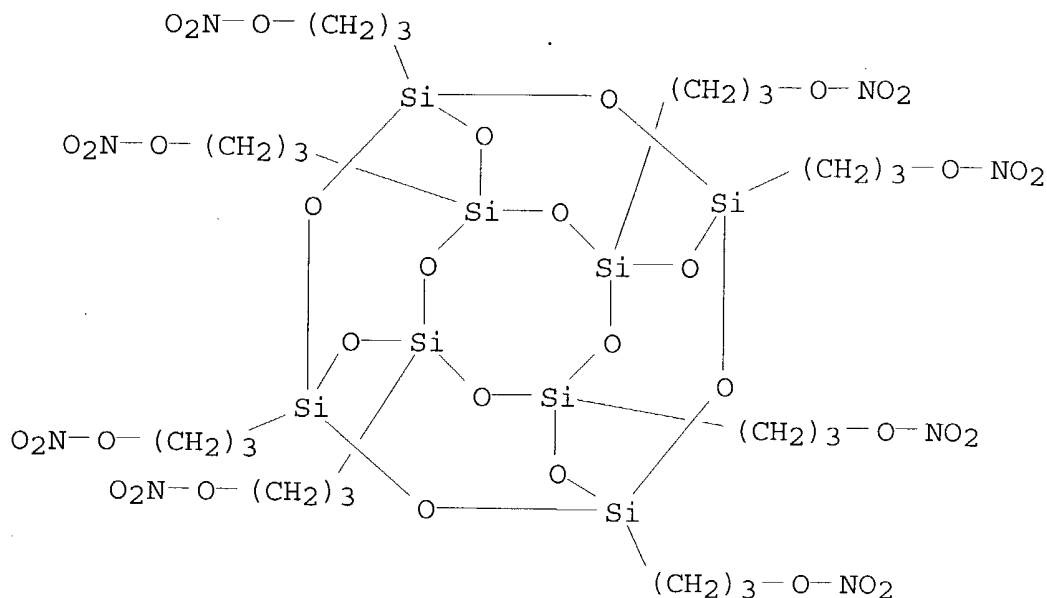
PAGE 2-A



RN 226726-51-8 HCA
 CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octakis(2-phenylethenyl)- (9CI) (CA INDEX NAME)



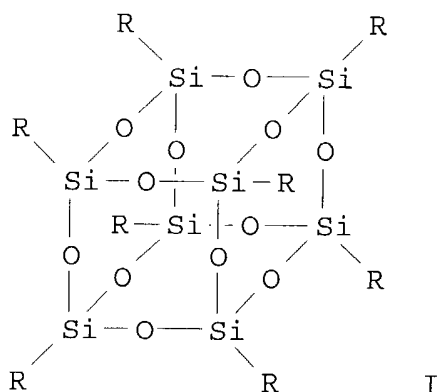
RN 226726-52-9 HCA
 CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxaneoctapropanol, octanitrate (9CI) (CA INDEX NAME)



- CC 29-11 (Organometallic and Organometalloidal Compounds)
Section cross-reference(s): 22
- ST **oligosilsesquioxane** chem ionization turbo ion spray mass spectrometry; heterosilsesquioxane chem ionization turbo ion spray mass spectrometry; ionization mass spectrometry
oligosilsesquioxane heterosilsesquioxane; turbo ion spray mass spectrometry **oligosilsesquioxane**
heterosilsesquioxane; metal transition main group compd
heterosilsesquioxane **oligosilsesquioxane**;
silsesquioxane oligo chem ionization turbo ion spray mass spectrometry
- IT Chemical ionization mass spectrometry
(atm.-pressure; mass spectrometric characterization of **polyhedral oligosilsesquioxanes** and heterosilsesquioxanes)
- IT Ion spray mass spectrometry
(mass spectrometric characterization of **polyhedral oligosilsesquioxanes** and heterosilsesquioxanes)
- IT Silsesquioxanes
(mass spectrometric characterization of **polyhedral oligosilsesquioxanes** and heterosilsesquioxanes)
- IT 3553-72-8 3809-28-7 47904-22-3 69655-76-1
118868-48-7 122471-06-1 132297-50-8 133323-69-0 143689-97-8
161678-38-2 203256-25-1 203256-28-4
226726-51-8 226726-52-9 226726-53-0
226726-54-1
(mass spectrometric characterization of **polyhedral oligosilsesquioxanes** and heterosilsesquioxanes)

129:203242 Octafunctionalized **polyhedral oligosilsesquioxanes** as scaffolds: synthesis of peptidyl silsesquioxanes. Feher, Frank J.; Wyndham, Kevin D.; Scialdone, Mark A. (Department of Chemistry, University of California, Irvine, CA, 92697-2025, USA). Chemical Communications (Cambridge) (14), 1469-1470 (English) 1998. CODEN: CHCOFS. ISSN: 1359-7345. Publisher: Royal Society of Chemistry.

GI



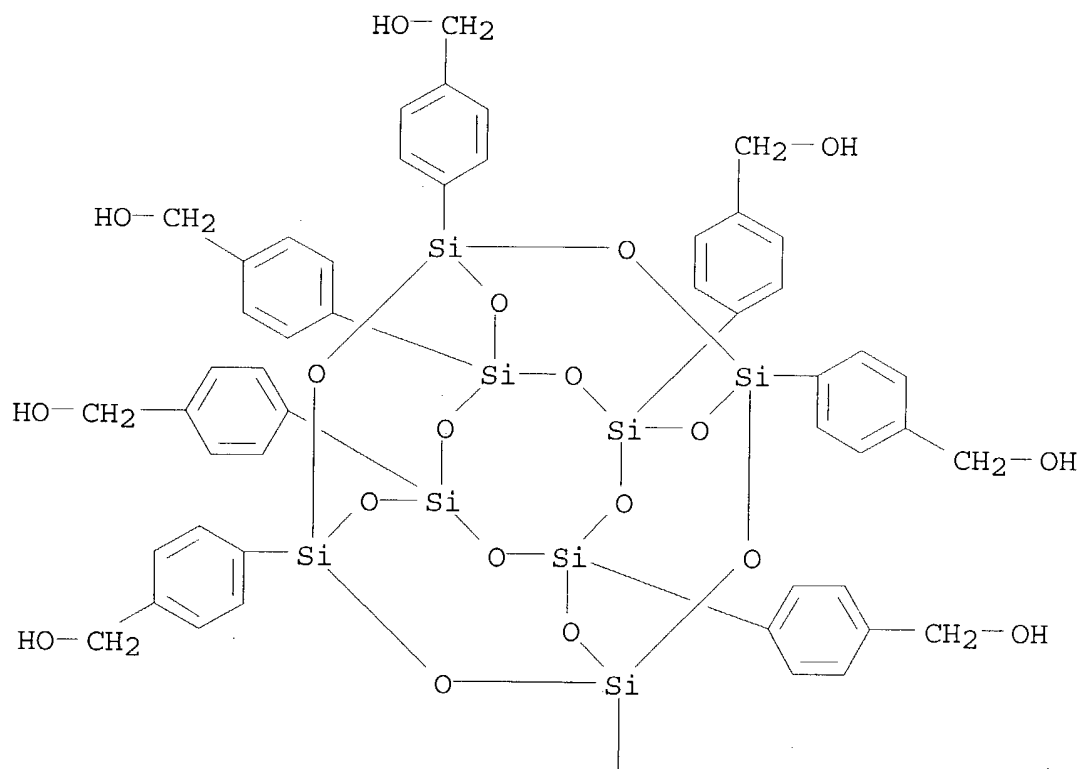
AB The first use of polyhedral silsesquioxanes I [$R = (CH_2)_3NH_2$, $p-C_6H_4CH_2OH$] to organize ensembles of biol. relevant motifs is described. N-Protected amino acids and peptides can be attached to the amino and hydroxy groups of I in either a convergent fashion or a divergent fashion to produce peptidyl silsesquioxanes in excellent yield and purity.

IT 127800-92-4 203256-25-1
(prepn. of peptidyl silsesquioxanes on octafunctionalized
polyhedral oligosilsesquioxane scaffolds)

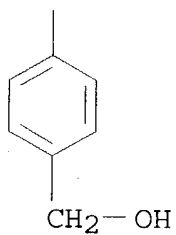
RN 127800-92-4 HCA

CN Benzenemethanol, 4,4',4'',4''',4'''',4''''',4''''',4''''''-
pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane-1,3,5,7,9,11,13,15-
octayloctakis- (9CI) (CA INDEX NAME)

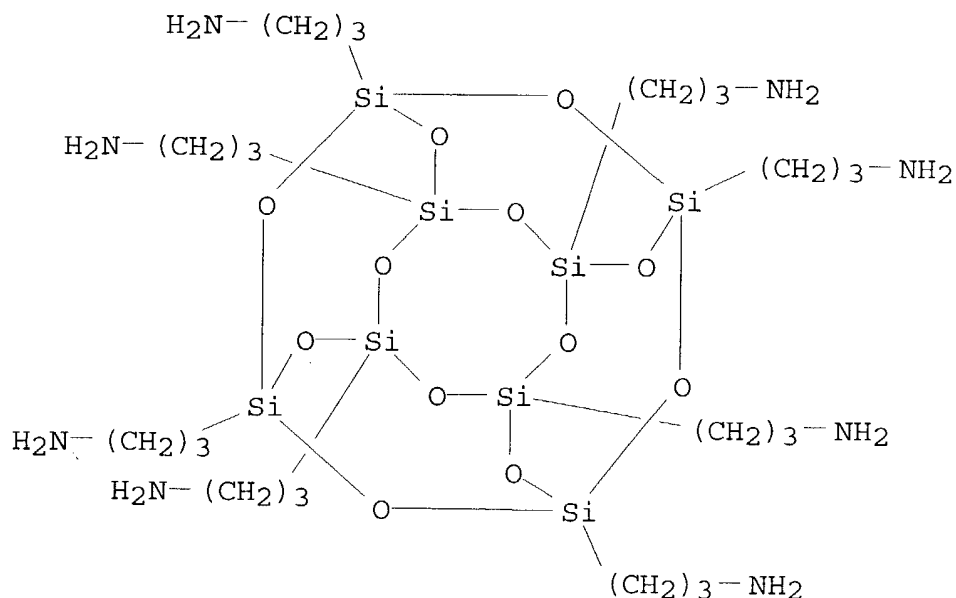
PAGE 1-A



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RN 203256-25-1 HCA
CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxaneoctapropanamine,
octahydrochloride (9CI) (CA INDEX NAME)



● 8 HCl

IT 212127-92-9P 212127-93-0P 212127-94-1P

212127-95-2P 212127-97-4P 212127-99-6P

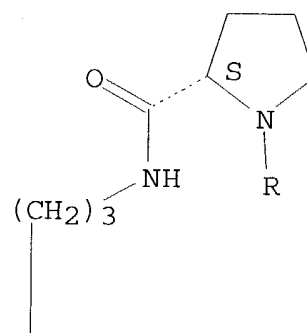
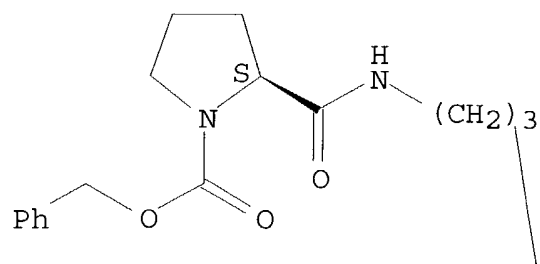
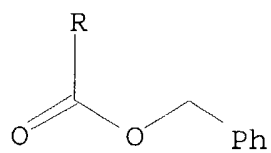
(prepn. of peptidyl silsesquioxanes on octafunctionalized
polyhedral oligosilsesquioxane scaffolds)

RN 212127-92-9 HCA

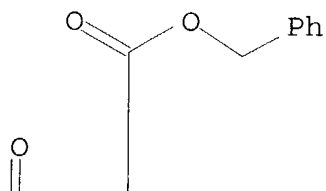
CN 1-Pyrrolidinecarboxylic acid, 2,2',2'',2''',2''''',2''''',2''''',2''''',2''''',
''''''-[pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane-
1,3,5,7,9,11,13,15-octayloctakis(3,1-propanediyliminocarbonyl)]octak
is-, octakis(phenylmethyl) ester, (2S,2'S,2''S,2'''S,2''''S,2''''S,2''''S,
2''''''S,2''''''S)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.

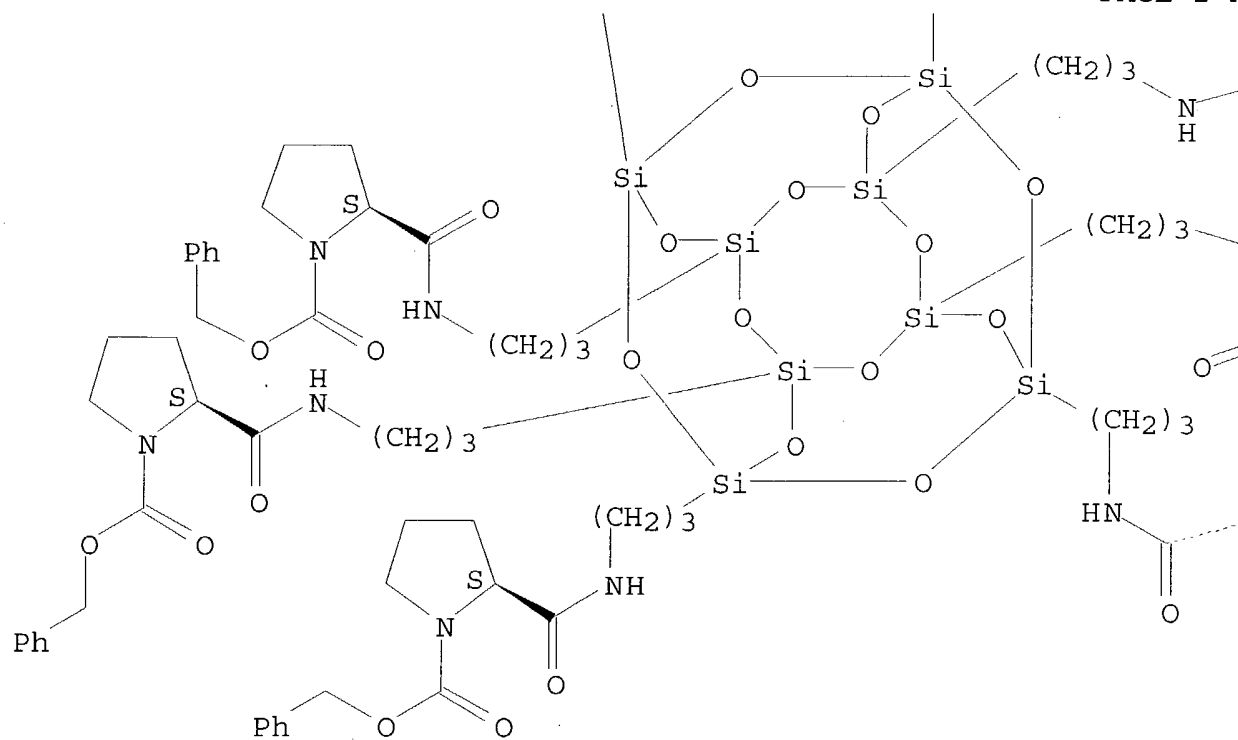
PAGE 1-A



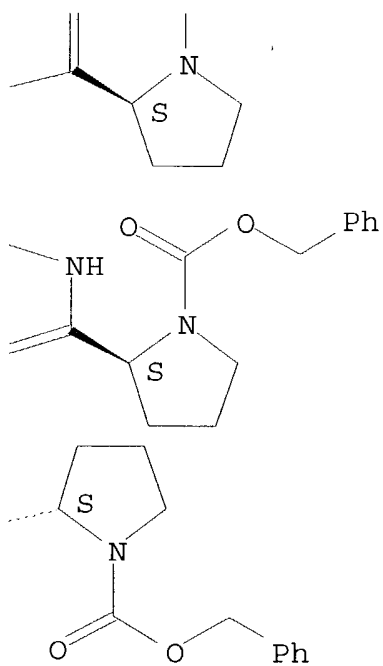
PAGE 1-B



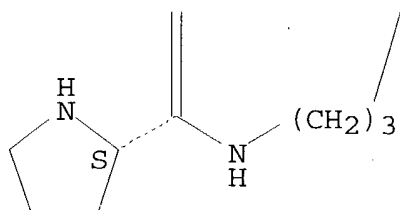
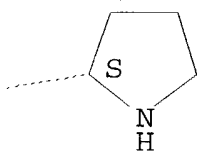
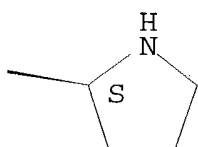
PAGE 2-A



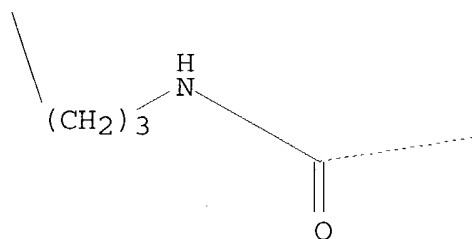
PAGE 2-B



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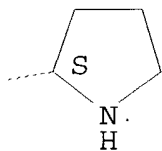


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● 8 HCl

PAGE 2-B

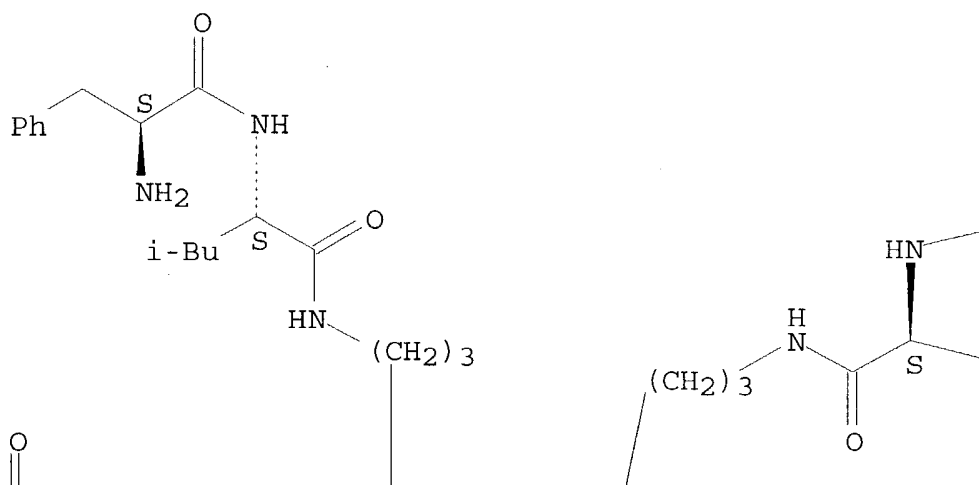


RN 212127-94-1 HCA

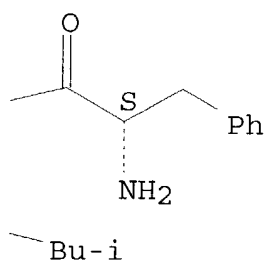
CN	L-Leucinamide, 2,2',2'',2''',2'''',2''''',2''''',2''''''- (pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane-1,3,5,7,9,11,13,15-octaylocta-3,1-propanediyl) octakis[L-phenylalanyl-, octahydrochloride (9CI) (CA INDEX NAME)
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Absolute stereochemistry.

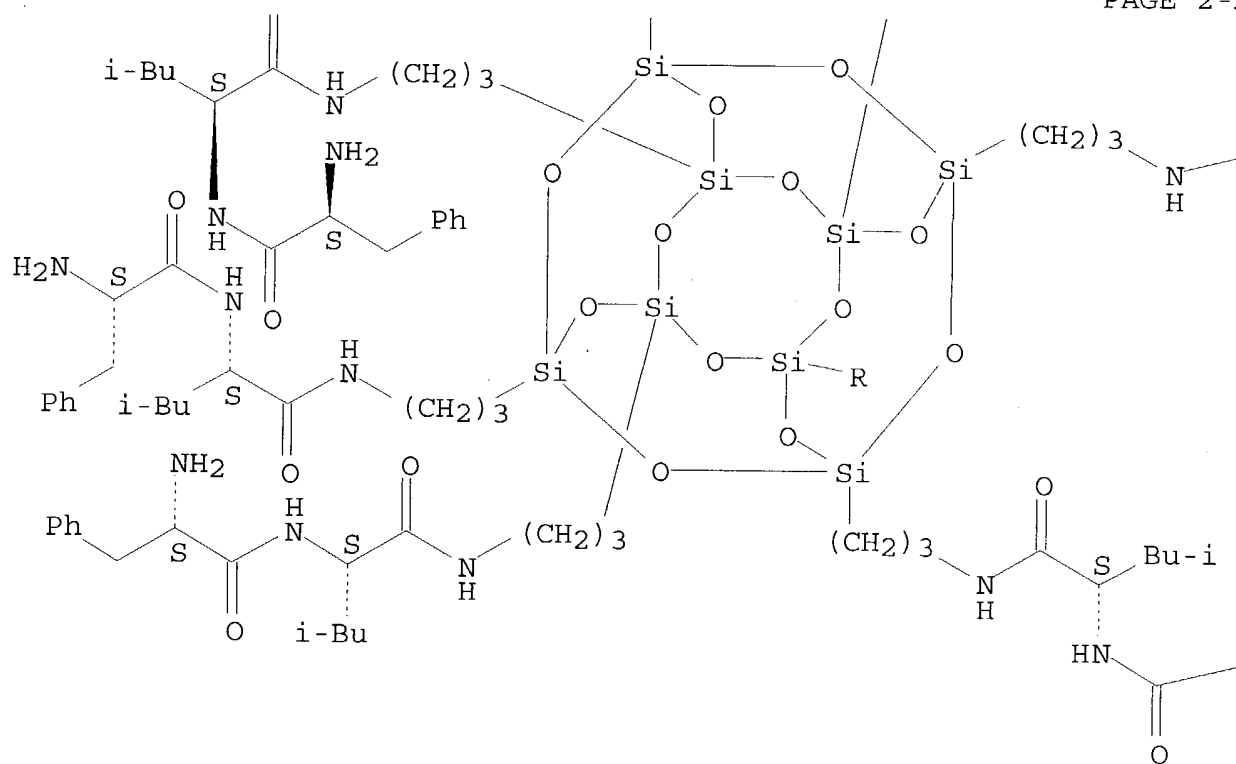
PAGE 1-A



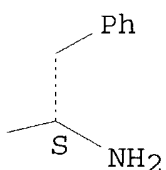
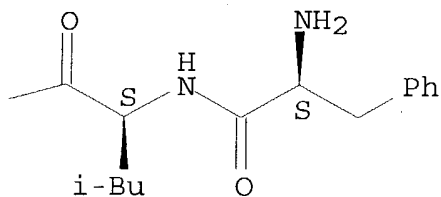
PAGE 1-B



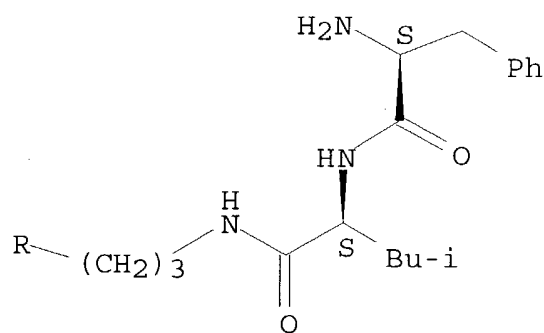
PAGE 2-A



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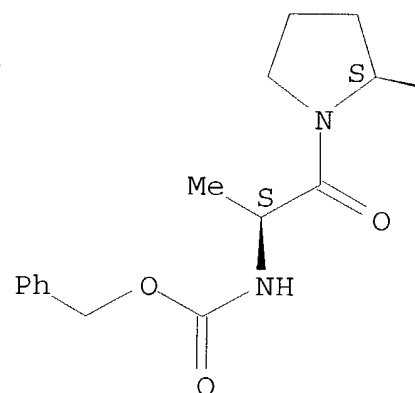
PAGE 3-A



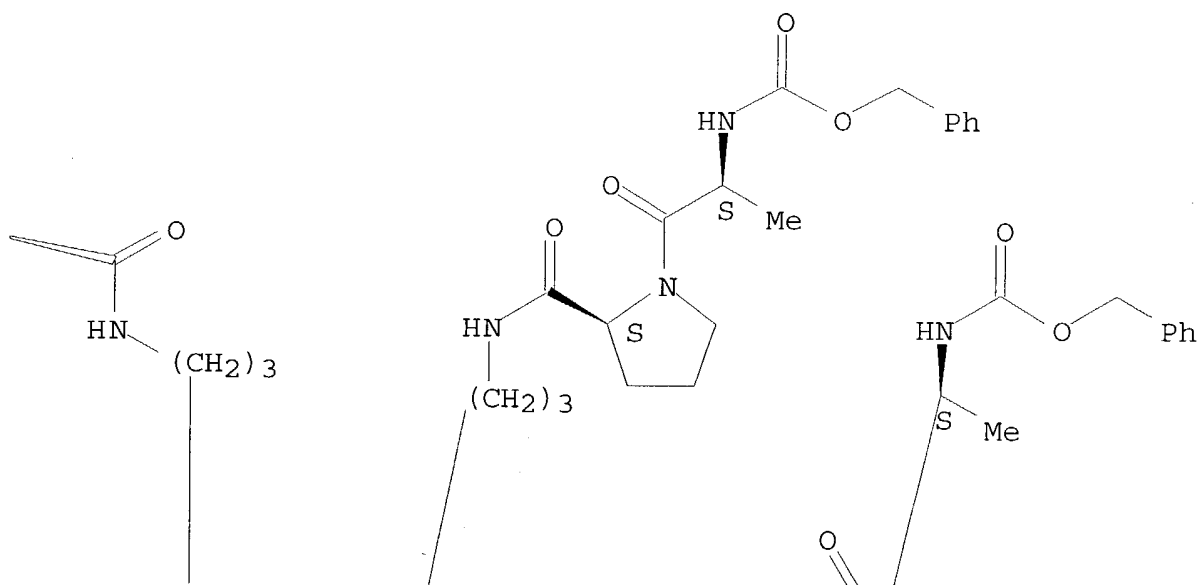
● 8 HCl

RN	212127-95-2	HCA
CN	L-Prolinamide, 2,2',2'',2''',2''''',2''''',2''''',2''''''',2'''''''''- (pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane-1,3,5,7,9,11,13,15- octaylocta-3,1-propanediyl)octakis[N-[(phenylmethoxy)carbonyl]-L- alanyl- (9CI) (CA INDEX NAME)	

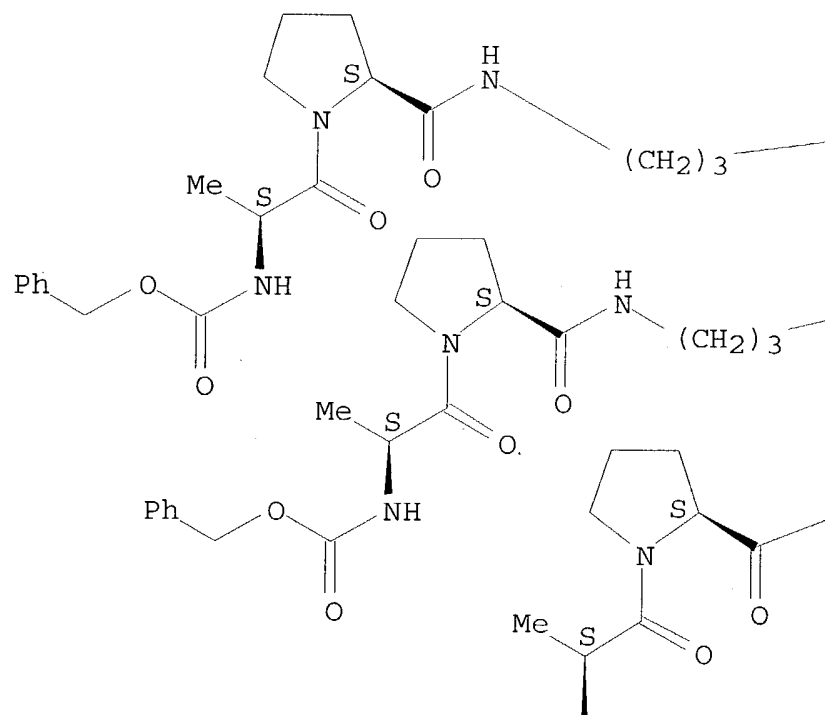
PAGE 1-A



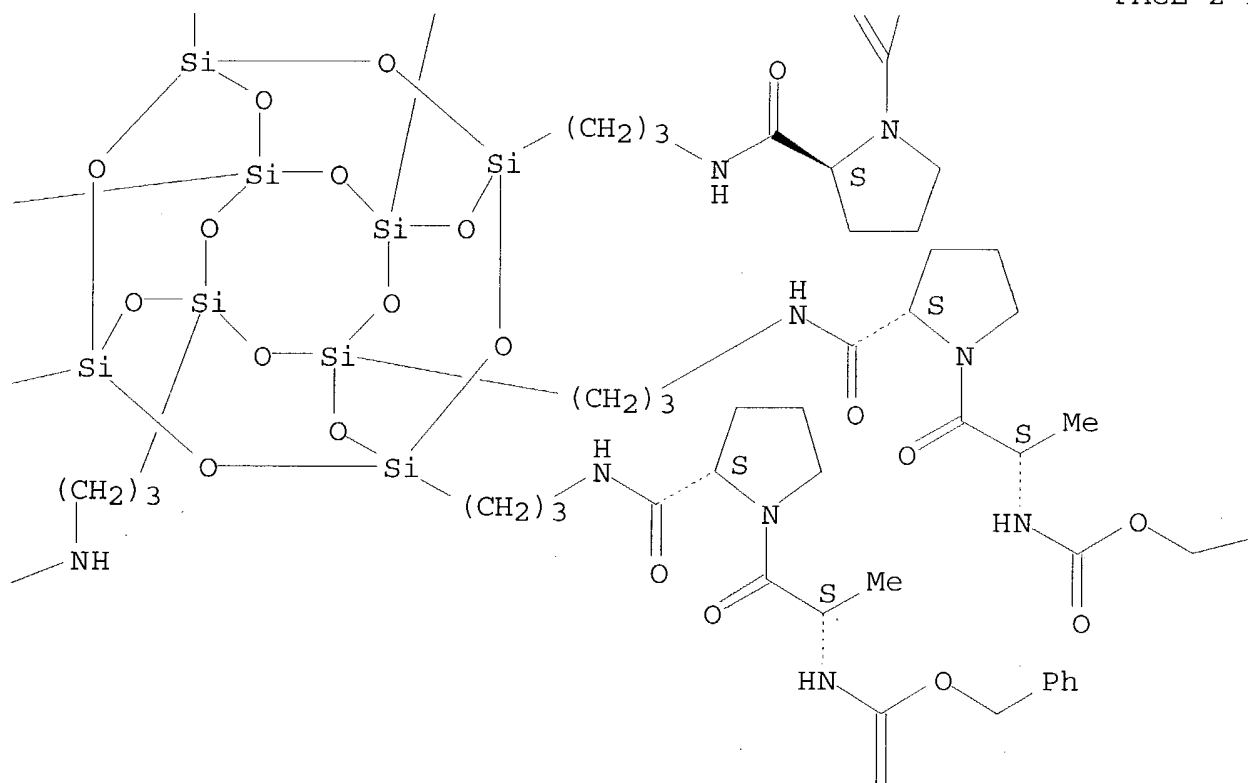
PAGE 1-B



PAGE 2-A



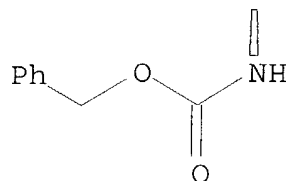
PAGE 2-B



PAGE 2-C

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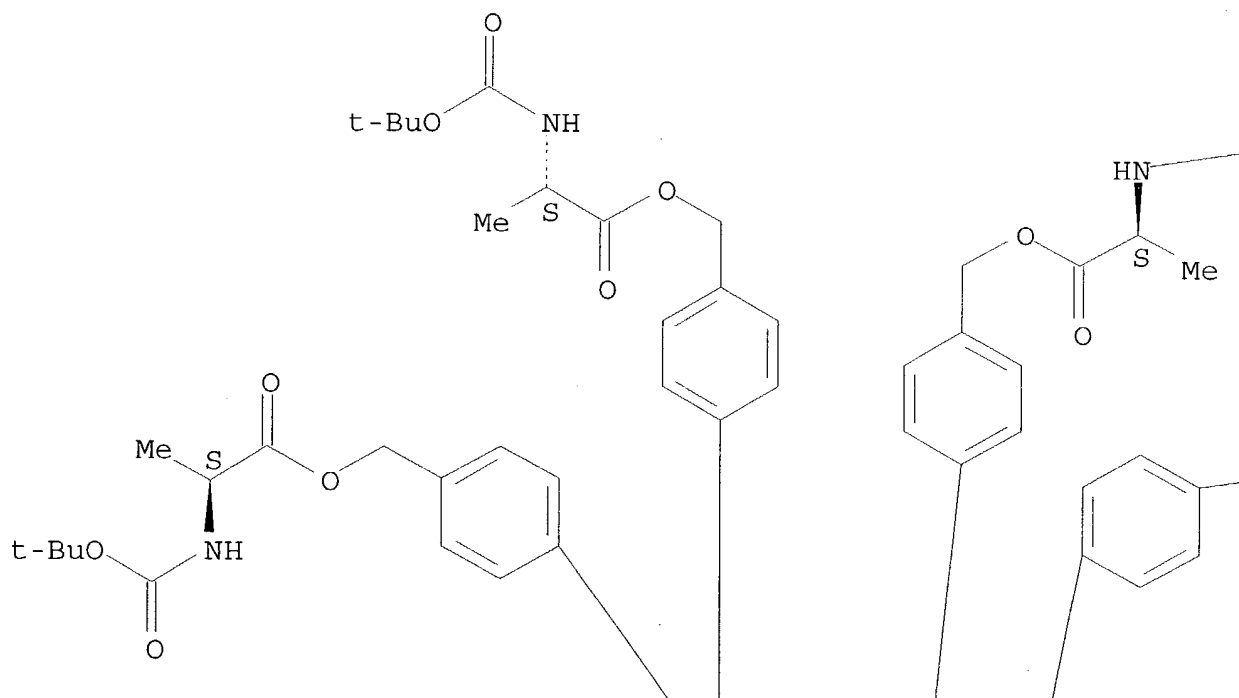


RN 212127-97-4 HCA

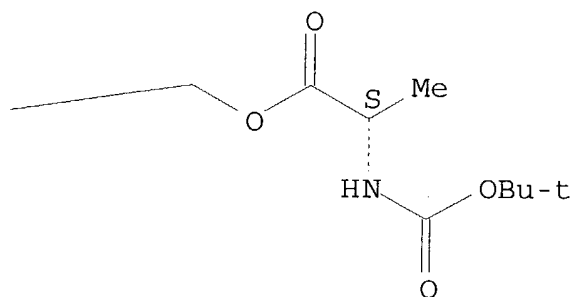
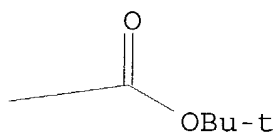
CN L-Alanine, N-[(1,1-dimethylethoxy)carbonyl]-,
 pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane-1,3,5,7,9,11,13,15-
 octayloctakis(4,1-phenylenemethylene) ester (9CI) (CA INDEX NAME)

Absolute stereochemistry.

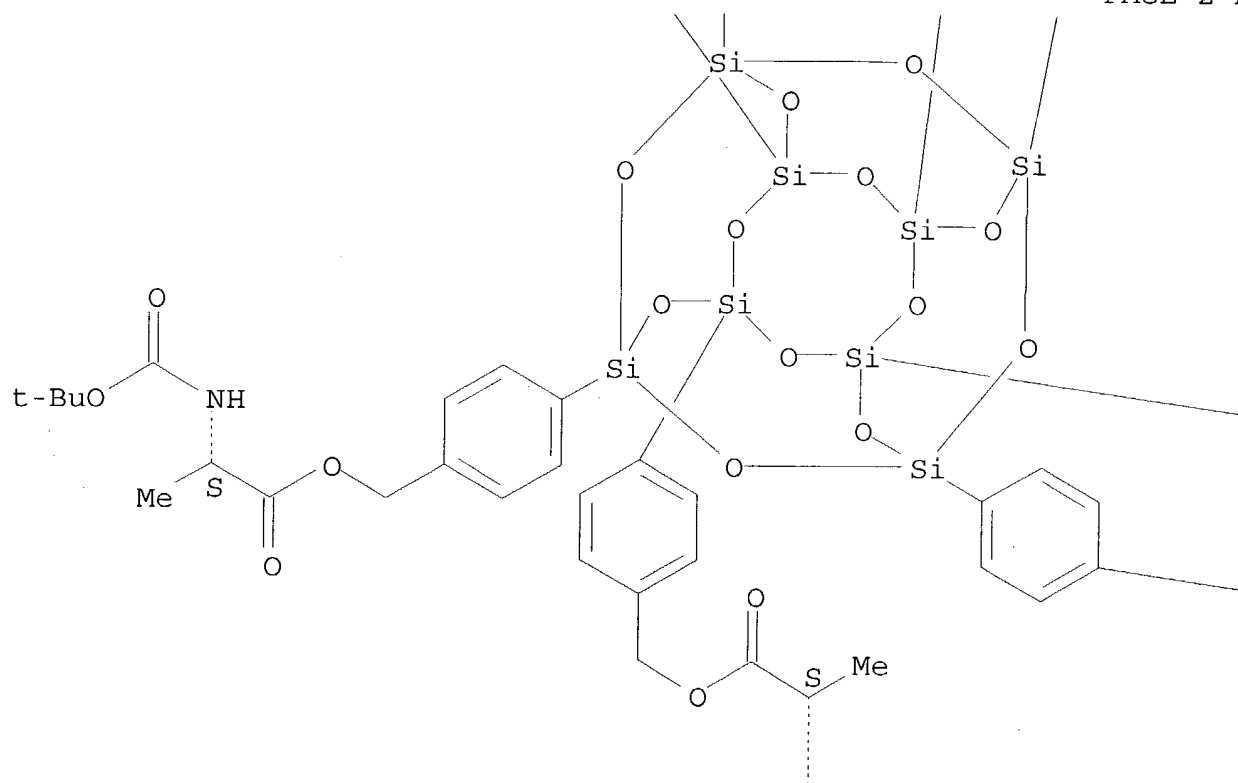
PAGE 1-A



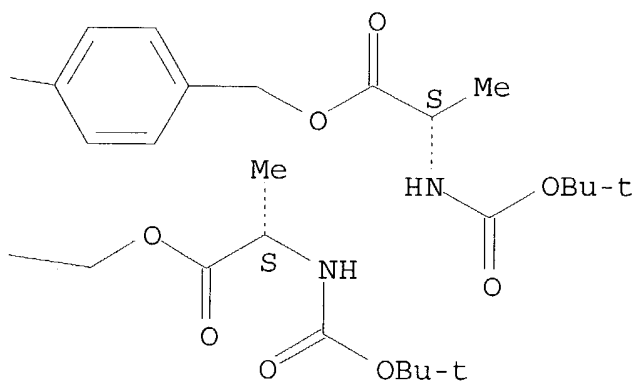
PAGE 1-B



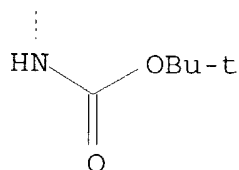
PAGE 2-A



PAGE 2-B



PAGE 3-A



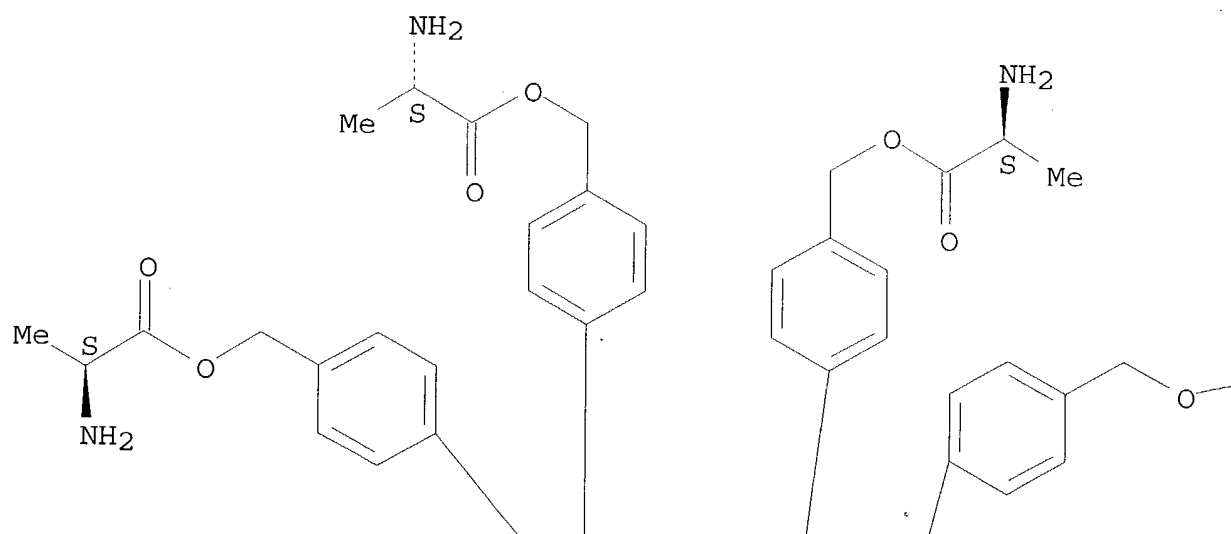
RN 212127-99-6 HCA
 CN L-Alanine, pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane-
 1,3,5,7,9,11,13,15-octayloctakis(4,1-phenylenemethylene) ester,
 octakis(trifluoroacetate) (9CI) (CA INDEX NAME)

CM 1

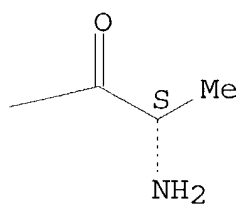
CRN 212127-98-5
 CMF C80 H96 N8 O28 Si8

Absolute stereochemistry.

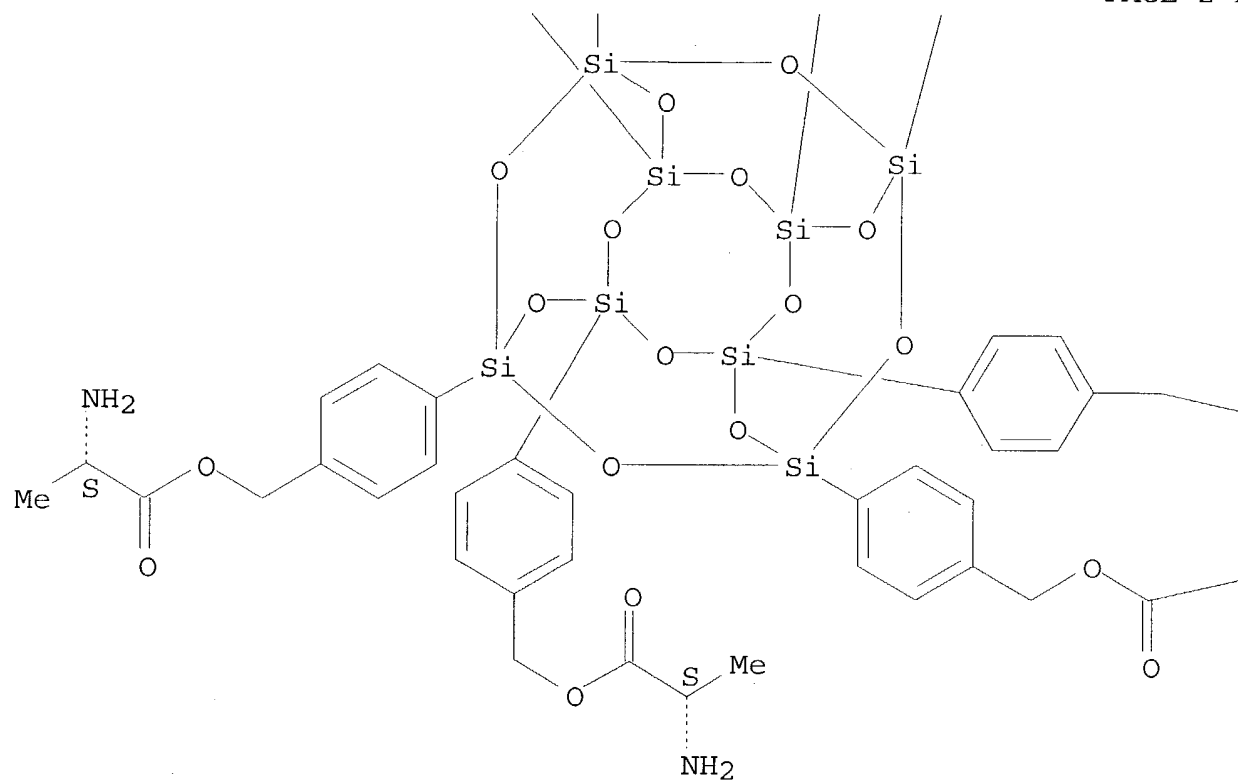
PAGE 1-A



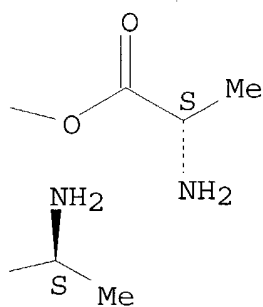
PAGE 1-B



PAGE 2-A



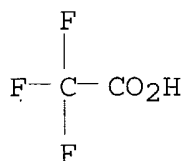
PAGE 2-B



CM 2

CRN 76-05-1

CMF C2 H F3 O2



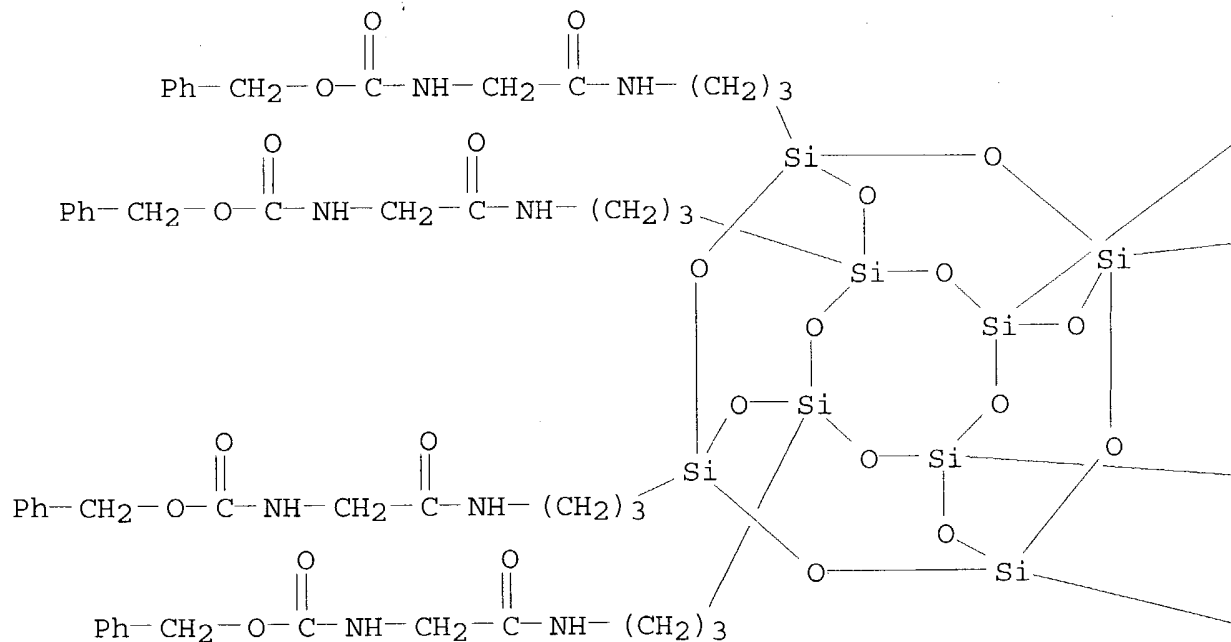
IT 212127-90-7P 212127-91-8P 212127-96-3P

(prepn. of peptidyl silsesquioxanes on octafunctionalized
polyhedral oligosilsesquioxane scaffolds)

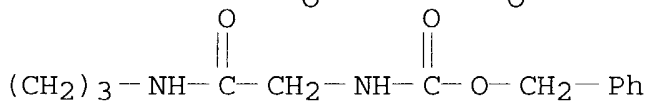
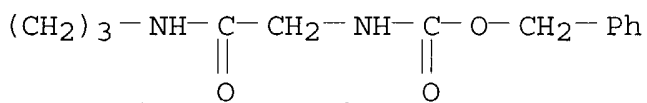
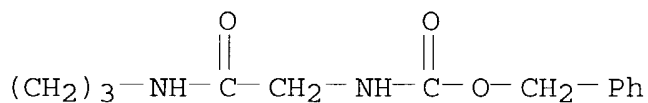
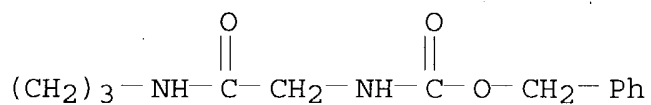
RN 212127-90-7 HCA

CN Carbamic acid, [pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane-
1,3,5,7,9,11,13,15-octayloctakis[3,1-propanediylimino(2-oxo-2,1-
ethanediyl)]]octakis-, octakis(phenylmethyl) ester (9CI) (CA INDEX
NAME)

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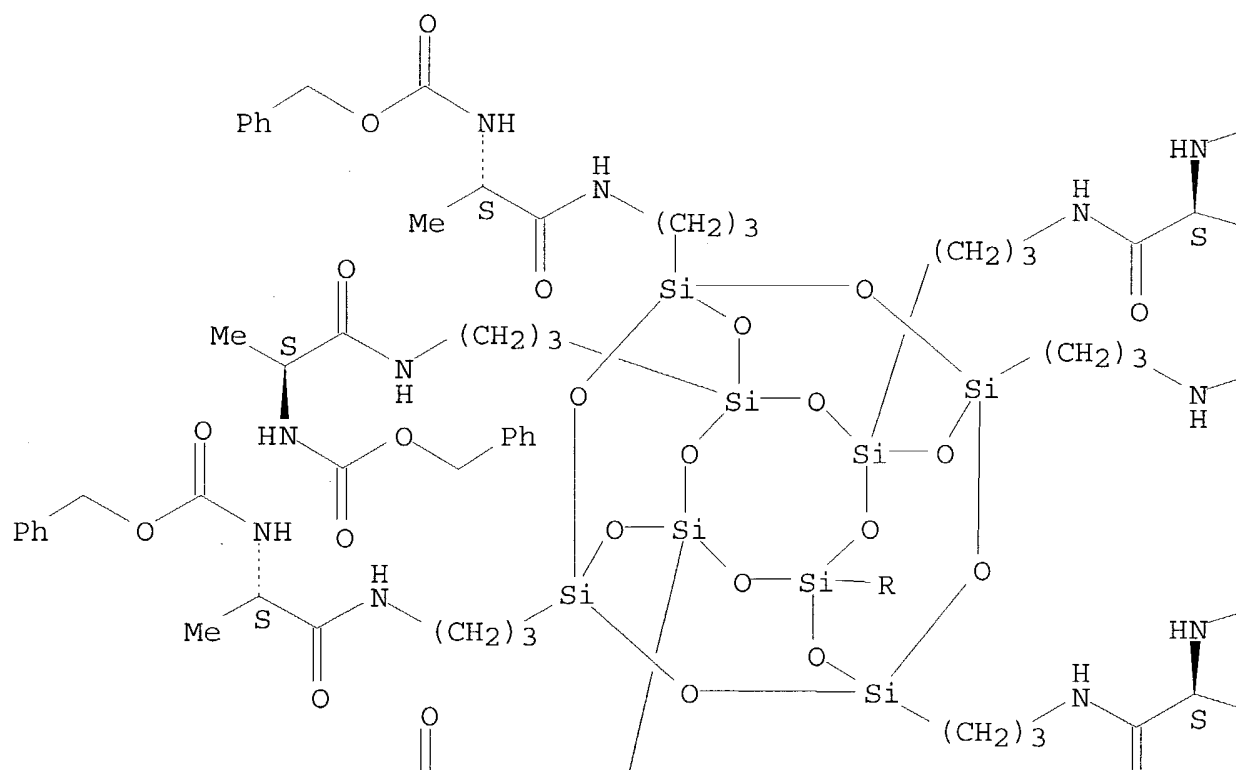


RN 212127-91-8 HCA

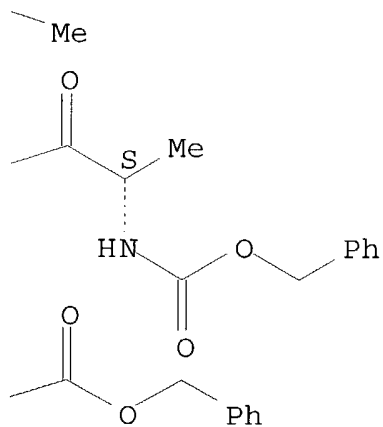
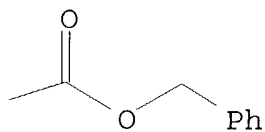
CN Carbamic acid, [pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane-1,3,5,7,9,11,13,15-octayloctakis[3,1-propanediylimino[(1S)-1-methyl-2-oxo-2,1-ethanediyl]]]octakis-, octakis(phenylmethyl) ester (9CI)
(CA INDEX NAME)

Absolute stereochemistry.

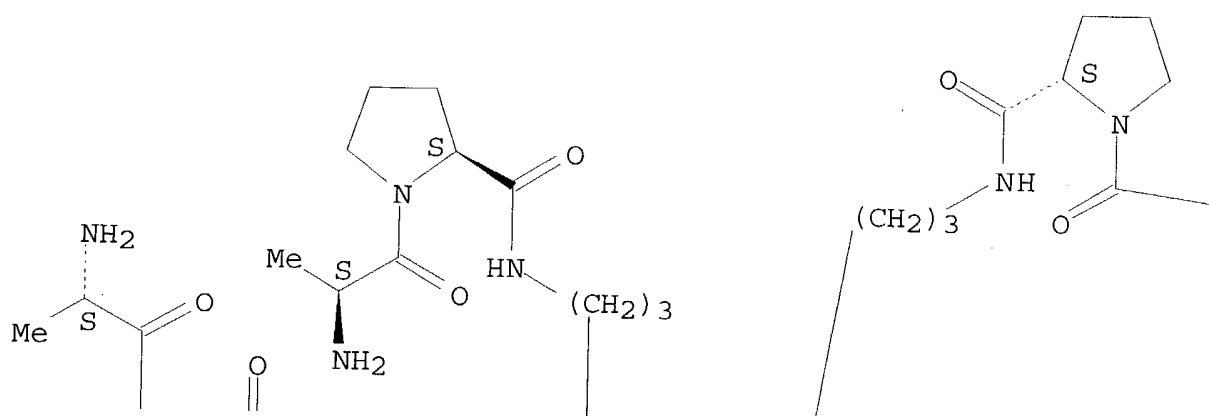
PAGE 1-A



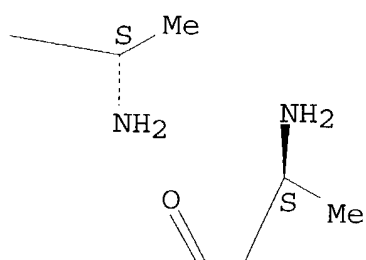
PAGE 1-B



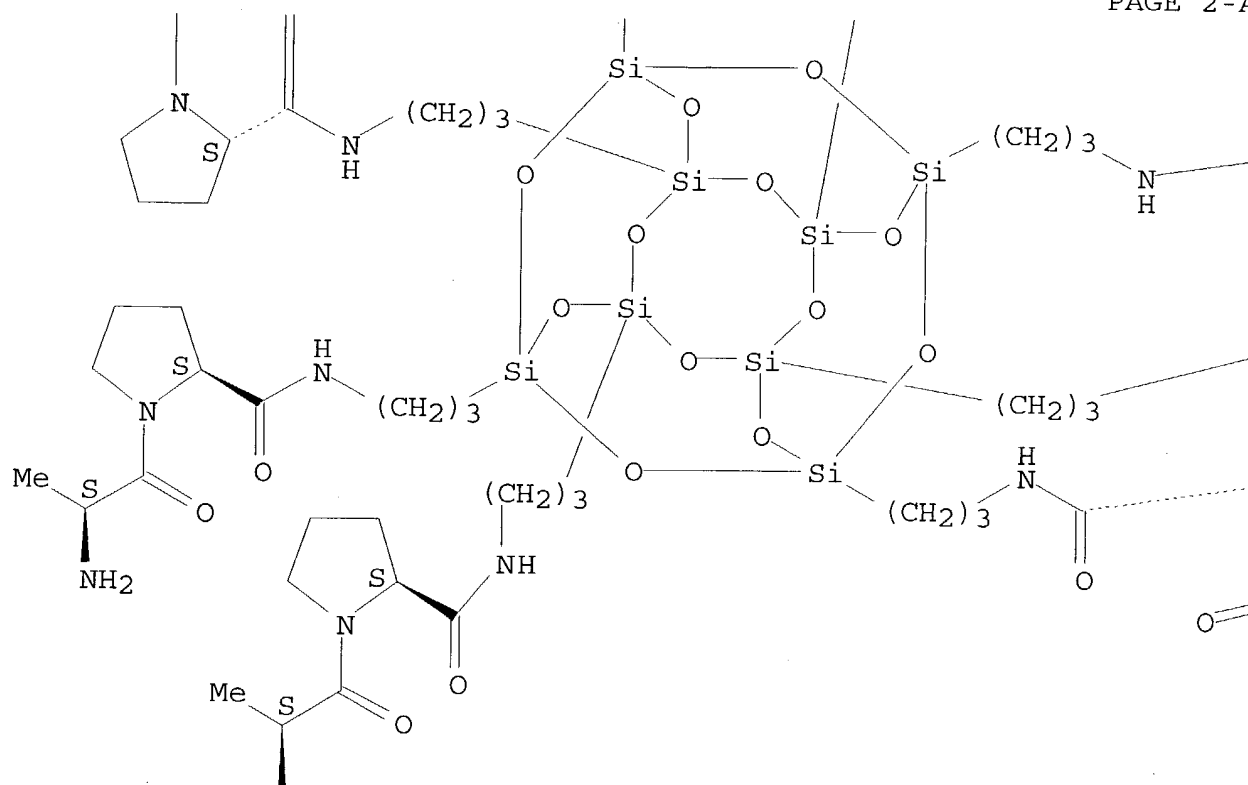
PAGE 1-A



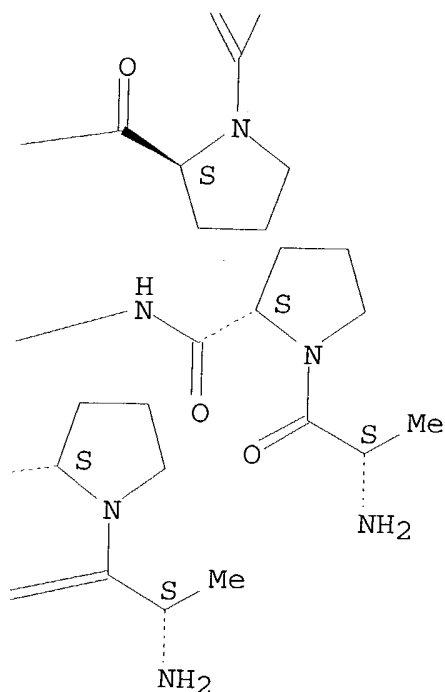
PAGE 1-B



PAGE 2-A



PAGE 2-B



PAGE 3-A



● 8 HCl

- CC 34-3 (Amino Acids, Peptides, and Proteins)
 Section cross-reference(s): 29
- IT Siloxanes (nonpolymeric)
 (octafunctionalized peptide derivs.; prepn. of peptidyl
 silsesquioxanes on octafunctionalized **polyhedral**
oligosilsesquioxane scaffolds)
- IT Peptides, preparation
 (silsesquioxane scaffold derivatized; prepn. of peptidyl
 silsesquioxanes on octafunctionalized **polyhedral**
oligosilsesquioxane scaffolds)
- IT 127800-92-4 203256-25-1
 (prepn. of peptidyl silsesquioxanes on octafunctionalized
polyhedral oligosilsesquioxane scaffolds)
- IT 212127-92-9P 212127-93-0P 212127-94-1P

212127-95-2P 212127-97-4P 212127-99-6P

212188-76-6P

(prepn. of peptidyl silsesquioxanes on octafunctionalized
polyhedral oligosilsesquioxane scaffolds)

IT 212127-90-7P 212127-91-8P 212127-96-3P

212187-88-7P 212188-69-7P 212189-21-4P 212189-29-2P

212189-55-4P

(prepn. of peptidyl silsesquioxanes on octafunctionalized
polyhedral oligosilsesquioxane scaffolds)

L46 ANSWER 18 OF 24 HCA COPYRIGHT 2003 ACS on STN

129:109589 Viscoelastic Responses of **Polyhedral**

Oligosilsesquioxane Reinforced Epoxy Systems. Lee, Andre;
Lichtenhan, Joseph D. (Department of Material Science and Mechanics,
Michigan State University, East Lansing, MI, 48824-1226, USA).
Macromolecules, 31(15), 4970-4974 (English) 1998. CODEN: MAMOBX.
ISSN: 0024-9297. Publisher: American Chemical Society.

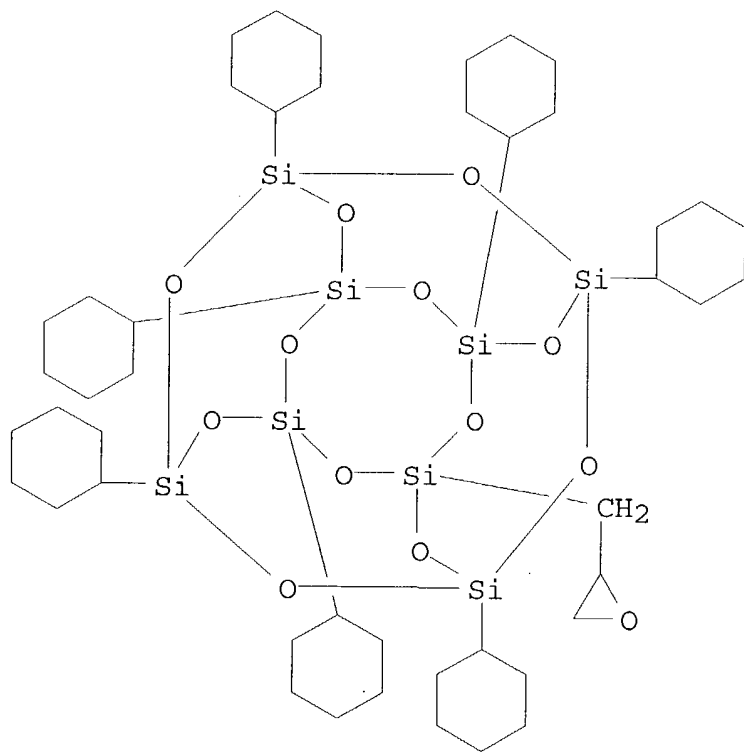
AB The thermal and viscoelastic property enhancements in commonly used
model epoxy resins reinforced with monofunctional polyhedral
oligomeric silsesquioxane (POSS)-epoxy macromers were studied. The
glass transitions of these POSS-epoxy nanocomposites were studied
using differential scanning calorimetry. Small-strain stress
relaxations under uniaxial deformation were examd. to provide
insight into the time-dependent viscoelastic behavior of these
nanocomposites. The POSS-epoxy macromers utilized in this study
were monofunctional and hence occupied chain terminus points within
the network. Nevertheless, they were effective at hindering the
mol. motion of the epoxy network junctions. Thus the glass
transition temp., Tg, was obsd. to increase with increasing wt.
fraction of the monofunctional POSS-epoxy. The viscoelastic
response at temps. below Tg was examd. and was found to correlate to
a stretched exponential relaxation function. Time-aging
time-superposition was applicable to the data under all test
conditions and for all of the materials used. Surprisingly, the
instantaneous modulus was not obsd. to be affected by incorporation
of the POSS nanoreinforcement. This suggests that while POSS cages
influence polymer chain motions, including the motion of the mol.
junctions, these nanoreinforcements did not participate in the
overall deformation of the chains. Expts. performed under identical
thermodn. states, revealed that the mol. level reinforcement
provided by the POSS cages also retarded the phys. aging process in
the glassy state. Therefore, the time required to reach structural
equil. was longer for samples reinforced with POSS-epoxy than for
those of the neat resins.

IT 209913-35-9DP, reaction products with Heloxy 67-Jeffamine
D-230 copolymer

(epoxy resin reinforced by)

RN 209913-35-9 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane,
heptacyclohexyl(oxiranylmethyl)-(9CI) (CA INDEX NAME)

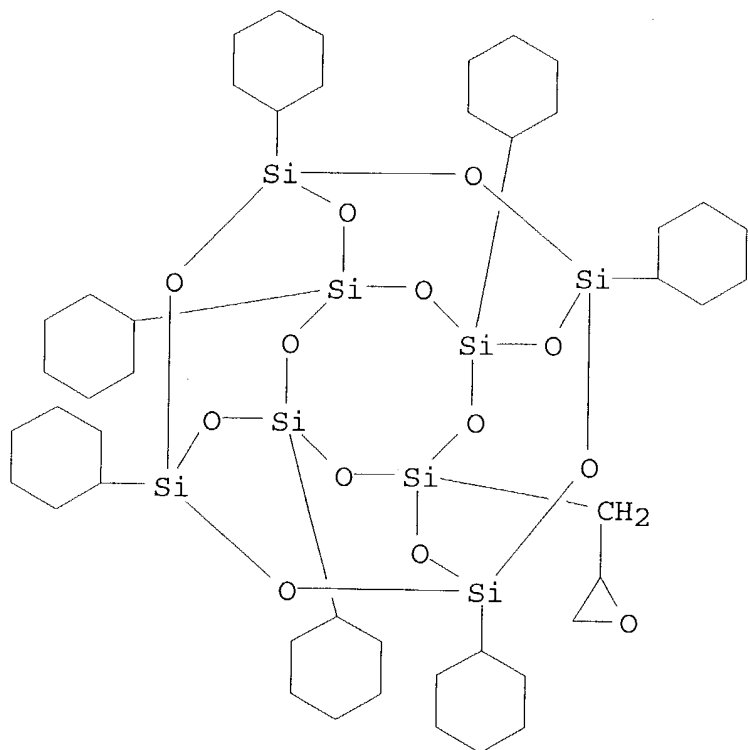


IT 209913-35-9P

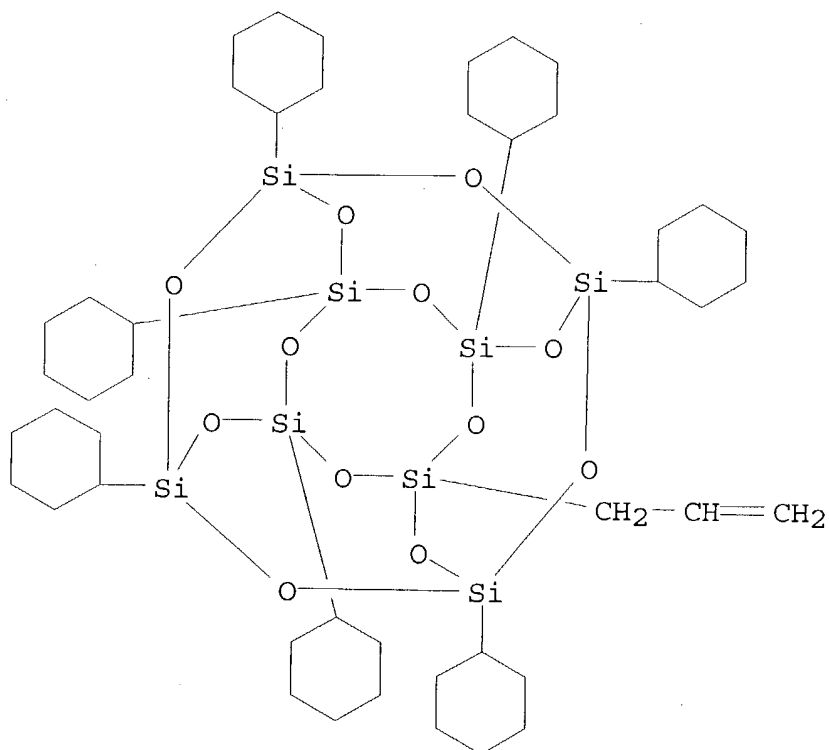
(prepn. of)

RN 209913-35-9 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane,
heptacyclohexyl(oxiranylmethyl)- (9CI) (CA INDEX NAME)



IT 205131-80-2
(reaction with chlorobenzoic acid)
RN 205131-80-2 HCA
CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, heptacyclohexyl(2-propenyl)- (9CI) (CA INDEX NAME)



- CC 37-5 (Plastics Manufacture and Processing)
- IT Glass transition temperature
- Stress relaxation
- Thermal aging
- Viscoelasticity
 (viscoelastic response of **polyhedral oligosilsesquioxane**-reinforced epoxy systems)
- IT Epoxy resins, properties
 (viscoelastic response of **polyhedral oligosilsesquioxane**-reinforced epoxy systems)
- IT 104521-93-9DP, reaction products with **polyhedral oligosilsesquioxanes** 209913-35-9DP, reaction products with Heloxy 67-Jeffamine D-230 copolymer (epoxy resin reinforced by)
- IT 209913-35-9P
 (prepn. of)
- IT 205131-80-2
 (reaction with chlorobenzoic acid)
- IT 535-80-8
 (reaction with **polyhedral oligosilsesquioxane** deriv.)
- IT 25085-99-8, DER 332
 (viscoelastic response of **polyhedral oligosilsesquioxane**-reinforced epoxy systems)

L46 ANSWER 19 OF 24 HCA COPYRIGHT 2003 ACS on STN

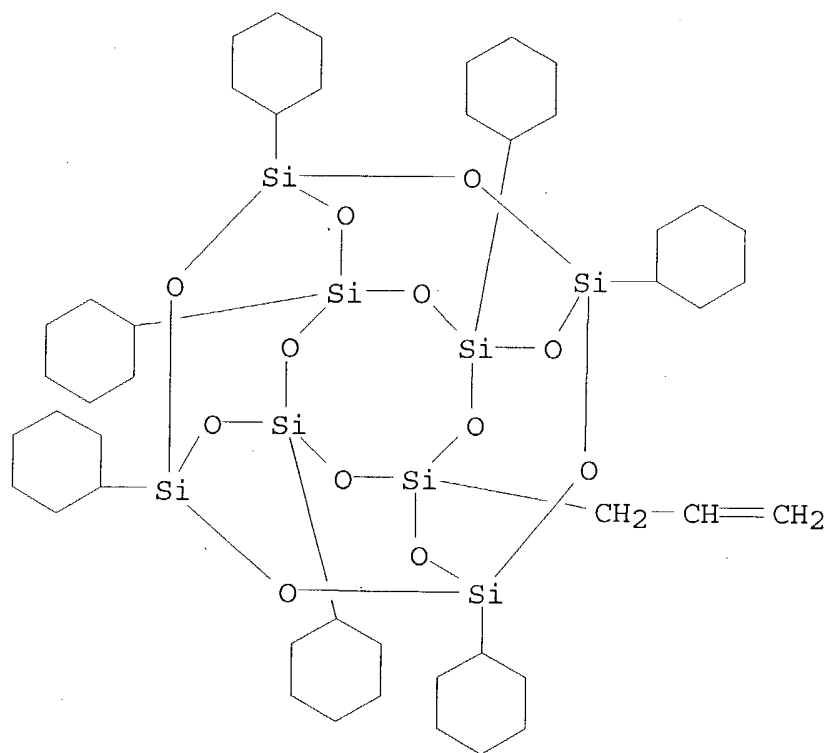
128:244480 Polydimethylsiloxanes modified with polyhedral oligomeric silsesquioxanes: from viscous oils to thermoplastics. Haddad, Timothy S.; Oviatt, Hank W.; Schwab, Joseph J.; Mather, Patrick T.; Chaffee, Kevin P.; Lichtenhan, Joseph D. (Hughes STX, AF Research Lab, Edwards AFB, CA, 93524-7680, USA). Polymer Preprints (American Chemical Society, Division of Polymer Chemistry), 39(1), 611-612 (English) 1998. CODEN: ACPPAY. ISSN: 0032-3934. Publisher: American Chemical Society, Division of Polymer Chemistry.

AB A program was begun to design and synthesize well-defined, linear **polyhedral oligosilsesquioxane** (POSS) polymers, $[\text{RSiO}_{1.5}]_n$, in order to further develop the structure/property relationships of this important class of technol. useful compds. A variety of "bead-type" POSS copolymers wherein the POSS unit is an integral part of the polymer backbone were previously synthesized and characterized. Initial attempts at synthesizing "pendant-type" POSS siloxanes by hydrosilating a POSS-macromer contg. a single allyl functionality onto poly(dimethyl-co-methylhydrido)siloxane are described. Polymers with varying proportions of POSS are synthesized and thermally characterized. Incorporation of the inorg. POSS group results in large changes to the obsd. glass transitions.

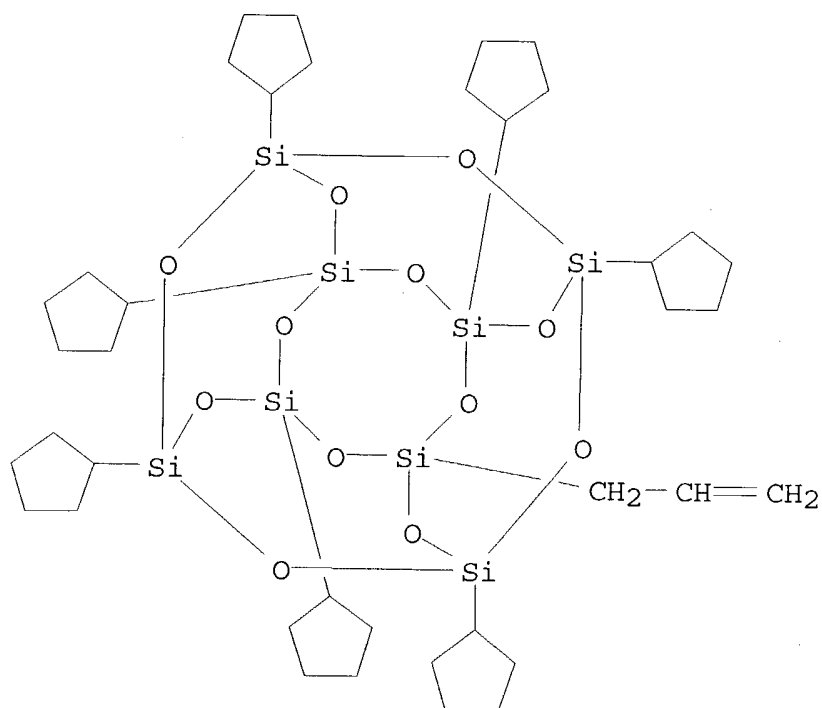
IT 205131-80-2DP, reaction products with polysiloxanes
205131-81-3DP, reaction products with polysiloxanes
(prepn. and properties of poly(dimethylsiloxanes) modified with polyhedral oligomeric silsesquioxanes)

RN 205131-80-2 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, heptacyclohexyl(2-propenyl)- (9CI) (CA INDEX NAME)



RN 205131-81-3 HCA
CN Pentacyclo[9.5.1.1.13,9.15,15.17,13]octasiloxane, heptacyclopentyl-2-propenyl- (9CI) (CA INDEX NAME)



CC 35-8 (Chemistry of Synthetic High Polymers)
 IT 156118-35-3DP, Dimethylsilanediol-methylsilanediol copolymer, trimethylsilyl-terminated, reaction products with polyhedral oligomeric silsesquioxane **205131-80-2DP**, reaction products with polysiloxanes **205131-81-3DP**, reaction products with polysiloxanes
 (prepn. and properties of poly(dimethylsiloxanes) modified with polyhedral oligomeric silsesquioxanes)

L46 ANSWER 20 OF 24 HCA COPYRIGHT 2003 ACS on STN
 127:149248 T8-OSS-ethyldiphenylphosphine: a new functional **oligosilsesquioxane** ligand. Ruffieux, Vincent; Schmid, Gunter; Braunstein, Pierre; Rose, Jacky (Institut Anorganische Chemie, Universitat Essen, Essen, D-45117, Germany). Chemistry--A European Journal, 3(6), 900-903 (English) 1997. CODEN: CEUJED. ISSN: 0947-6539. Publisher: Wiley-VCH.
 AB **Oligosilsesquioxanes** (OSS) may be considered as mol. sections of SiO₂. The incompletely condensed (cyclopentyl)₇T₇(OH)₃ (T = SiO_{3/2}) was used to generate a phosphine-functionalized T8-OSS system by reaction with 2-(trichlorosilyl)diphenylphosphinoethane. The resulting model mol. (cyclopentyl)₇T₈(CH₂)₂PPh₂ (1) is well suited to coordinate to transition metal clusters via the phosphorous atoms. The authors selected the tetrahedral bimetallic cluster [HFeCo₃(CO)₁₂]. Depending on the stoichiometry, one or two phosphine ligands could be added to the Co atoms, with substitution of CO mols. Owing to the cyclopentyl substituents, the resulting complexes [HFeCo₃(CO)₁₁{Ph₂P(CH₂)₂T₈(cyclopentyl)₇}] (2) and

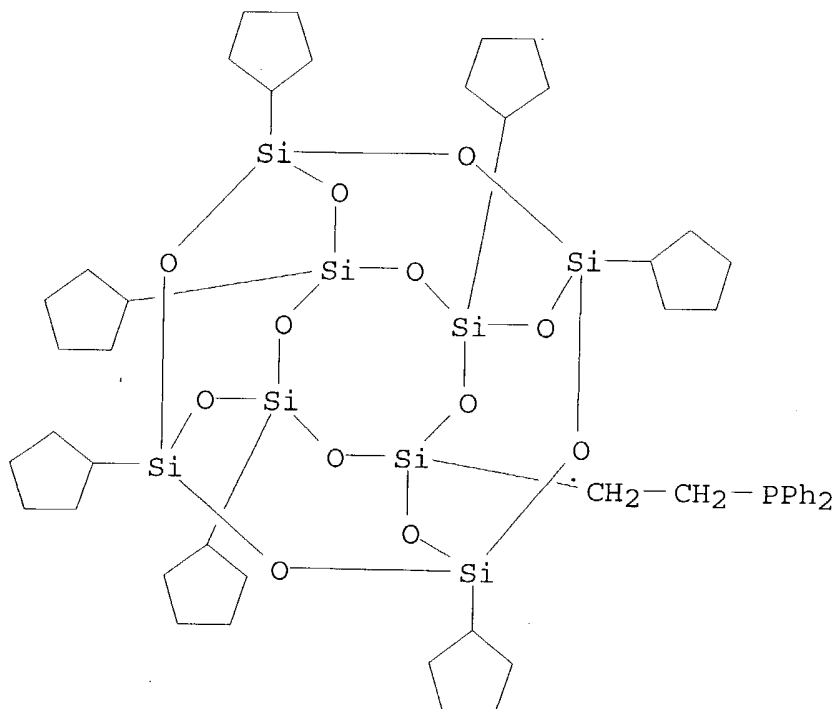
[HFeCo₃(CO)₁₀{Ph₂P(CH₂)₂T₈(cyclopentyl)₇}₂] (3) are sol. in numerous org. solvents. Therefore, they could be completely characterized by ¹H, ¹³C, ²⁹Si, and ³¹P NMR spectroscopy.

IT 193404-80-7P

(prepn. and ligand substitution reaction with irontricobalt carbonyl cluster)

RN 193404-80-7 HCA

CN Phosphine, [2-(heptacyclopentylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)ethyl]diphenyl- (9CI) (CA INDEX NAME)



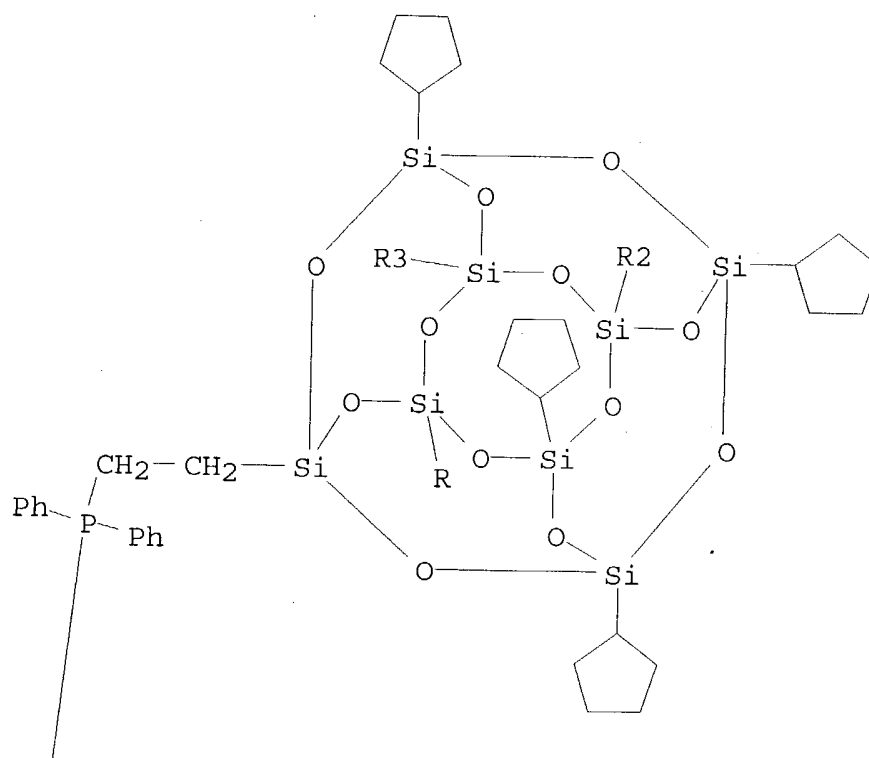
IT 193404-81-8P

(prepn. and reaction with oligosilsesquioxane)

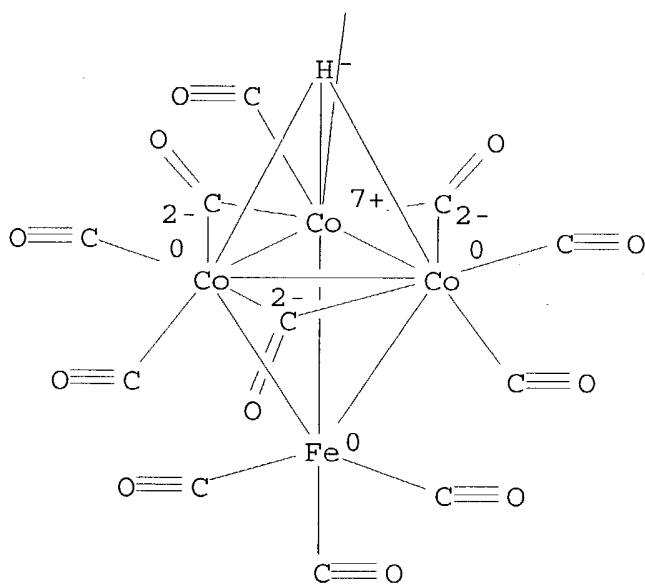
RN 193404-81-8 HCA

CN Iron, tricarbonyl[tri- μ -carbonylpentacarbonyl[[2-(heptacyclopentylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)ethyl]diphenylphosphine- κ P]- μ -3-hydrotricobalt]-, tetrahedro, stereoisomer (9CI) (CA INDEX NAME)

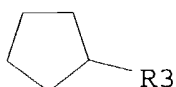
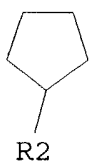
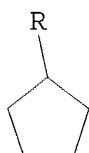
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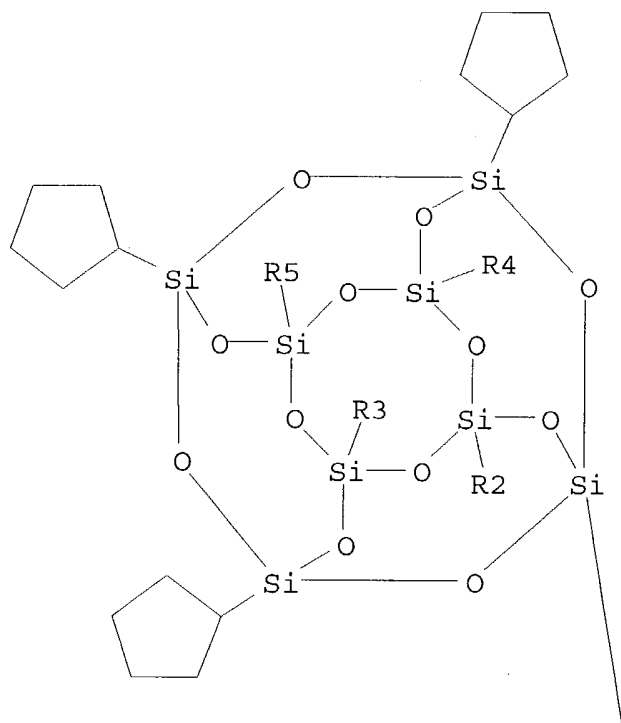
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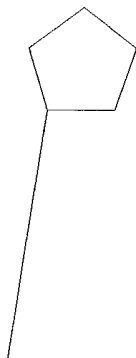
IT 193404-82-9P
 (prepn. of)
 RN 193404-82-9 HCA

CN Iron, tricarbonyl[tri- μ -carbonyltetracarbonylbis[[2-(heptacyclopentylpentacyclo[9.5.1.13,9.15,15.17,13]octasiloxanyl)ethyl]diphenylphosphine- κ .P]- μ .3-hydrotricobalt]-, tetrahedro, stereoisomer (9CI) (CA INDEX NAME)

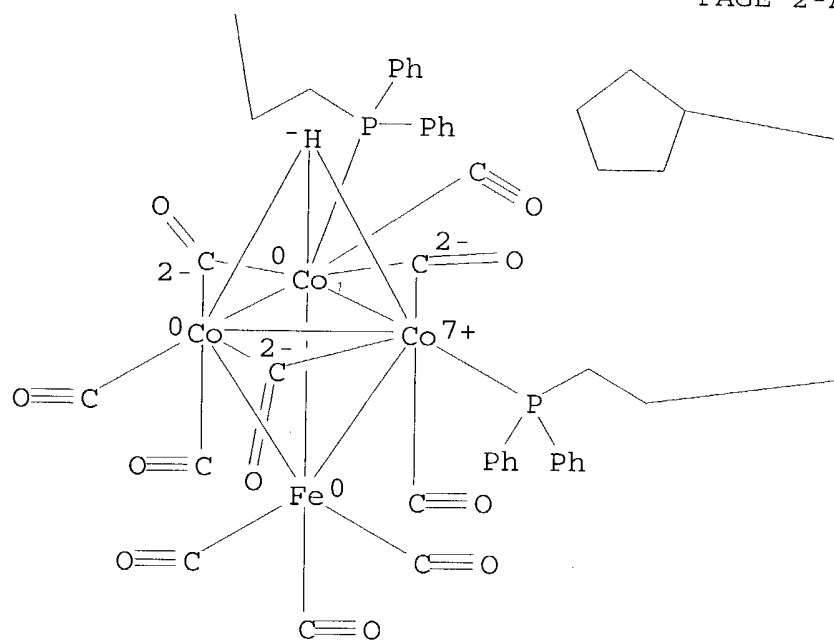
PAGE 1-A



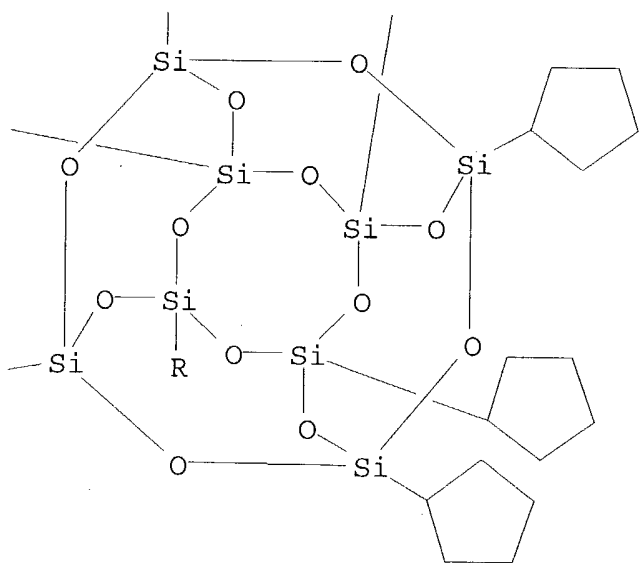
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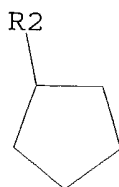
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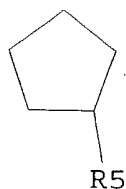
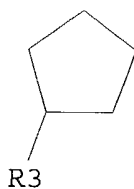
PAGE 2-B



PAGE 3-A

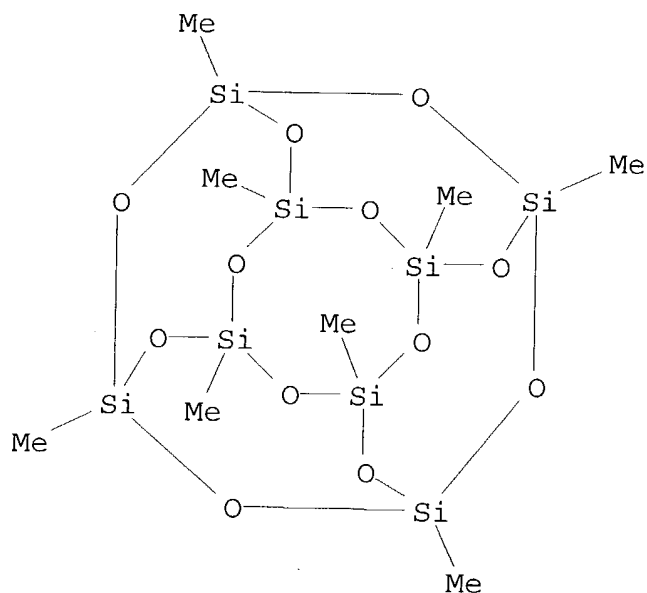


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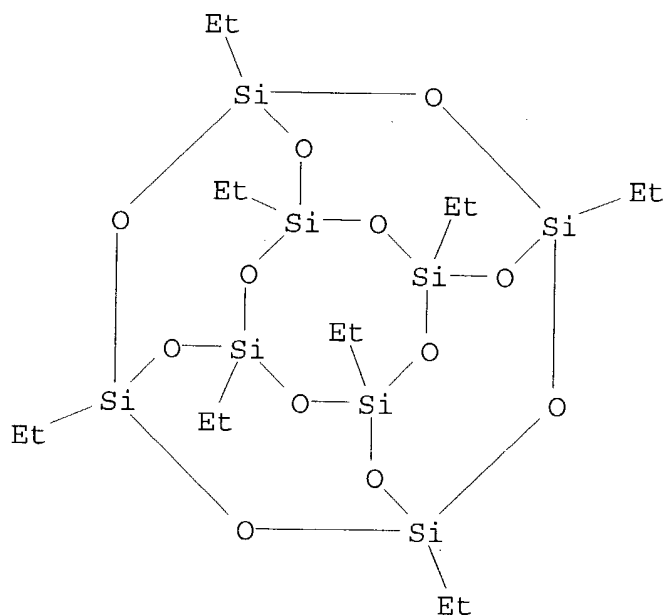


CC 29-14 (Organometallic and Organometalloidal Compounds)
 ST **oligosilsesquioxane** phosphine functionalized prepn
 irontricobalt cluster; irontricobalt cluster ligand substitution
 phosphinoethyl **oligosilsesquioxane**;

- cyclopentyltrichlorosilane slow hydrolysis conversion
oligosilsesquioxane; cobalt iron cluster ligand substitution
phosphinoethyloligosilsesquioxane
- IT Transition metal compounds
Transition metal compounds
(cluster compds.; prepn. and ligand substitution reaction of
phosphine-functionalized **oligosilsesquioxane** ligand
with)
- IT Substitution reaction, coordinative
(of phosphine-functionalized **oligosilsesquioxane** ligand
with transition metal clusters)
- IT Cluster compounds
Cluster compounds
(transition metal; prepn. and ligand substitution reaction of
phosphine-functionalized **oligosilsesquioxane** ligand
with)
- IT 4145-77-1P
(prepn. and condensation reaction with
oligosilsesquioxane)
- IT 193404-80-7P
(prepn. and ligand substitution reaction with irontricobalt
carbonyl cluster)
- IT 193404-81-8P
(prepn. and reaction with **oligosilsesquioxane**)
- IT 14579-03-4P, Cyclopentyltrichlorosilane
(prepn. and slow hydrolysis to give an incompletely condensed
oligosilsesquioxane)
- IT 193404-82-9P
(prepn. of)
- L46 ANSWER 21 OF 24 HCA COPYRIGHT 2003 ACS on STN
117:234094 Peralkyloligohomosilsesquioxanes. Voronkov, M. G.; Basenko,
S. V.; Pavlinskii, V. G.; Mirskov, R. G. (Irkutsk, Inst. Org. Khim.,
Irkutsk, Russia). Metalloorganicheskaya Khimiya, 5(3), 557-63
(Russian) 1992. CODEN: MEKHEX. ISSN: 0235-0114.
- AB A method for synthesis of previously unknown
peralkyloligohomosilsesquioxanes (RSiO_{1.5})_n(R₂SiO)_m (R = Me, Et, n =
2, 4, 6, 8, 10, 12; m = 1-4) as well as peralkyloligosilsesquioxanes
(RSiO_{1.5})_n (n = 6, 8, 10, 12, 14) (yield 40-60%) was developed. It
is based on vacuum thermolysis of polyalkylsilsesquioxanes
(RSiO_{1.5})_x in the presence of alkali metal or aluminum fluorides.
Thermolysis of (EtSiO_{1.5})_x is also catalyzed by KCl, KBr, and KI.
Mass spectra of the compds. obtained were investigated.
- IT 17865-85-9 18971-70-5
(thermolysis of, in presence of metal fluorides)
- RN 17865-85-9 HCA
- CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octamethyl- (7CI,
9CI) (CA INDEX NAME)



RN 18971-70-5 HCA
 CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octaethyl- (9CI)
 (CA INDEX NAME)



CC 29-6 (Organometallic and Organometalloidal Compounds)
 ST oligohomosilsesquioxane peralkyl; **silsesquioxane**
oligo homo; thermolysis alkylsilsesquioxane metal fluoride
 catalyst
 IT 17865-85-9 18971-70-5

(thermolysis of, in presence of metal fluorides)

L46 ANSWER 22 OF 24 HCA COPYRIGHT 2003 ACS on STN

115:92592 Facile syntheses of new incompletely condensed

polyhedral oligosilsesquioxanes:

[(c-C₅H₉)₇Si₇O₉(OH)₃], [(c-C₇H₁₃)₇Si₇O₉(OH)₃], and [(c-C₇H₁₃)₆Si₆O₇(OH)₄]. Feher, Frank J.; Budzichowski, Theodore A.; Blanski, Rusty L.; Weller, Keith J.; Ziller, Joseph W. (Dep. Chem., Univ. California, Irvine, CA, 92717, USA). Organometallics, 10(7), 2526-8 (English) 1991. CODEN: ORGND7. ISSN: 0276-7333.

AB Facile syntheses of three new incompletely condensed

polyhedral oligosilsesquioxanes are reported.

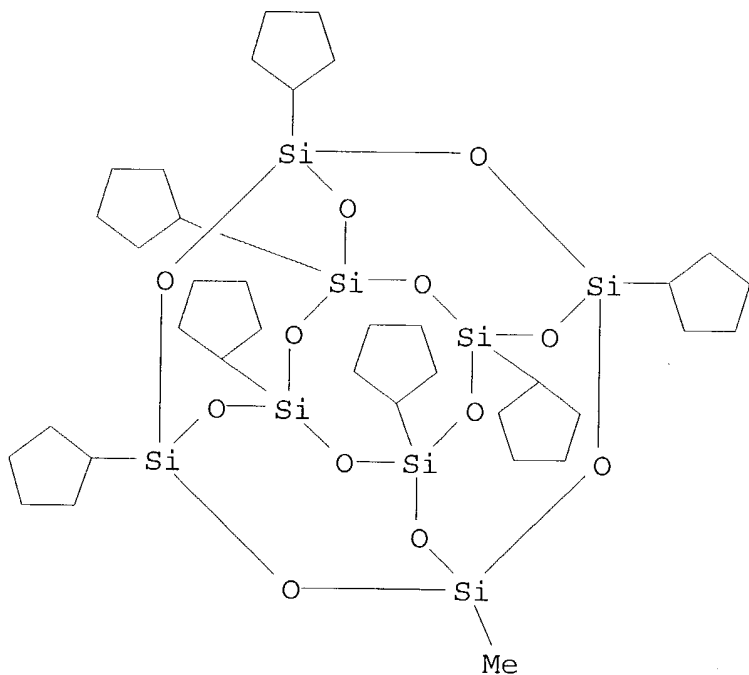
Trisilanols [(c-C₅H₉)₇Si₇O₉(OH)₃] and [(c-C₇H₁₃)₇Si₇O₉(OH)₃] are prepd. in 29% and 26% yields, resp., by the hydrolytic condensation reactions of c-C₅H₉SiCl₃ and c-C₇H₁₃SiCl₃ in refluxing aq. acetone. The hydrolytic condensation of c-C₇H₁₃SiCl₃ at 25.degree. also affords tetrasilanol [(c-C₇H₁₃)₆Si₆O₇(OH)₄] in 7% yield. These straightforward syntheses produce multigram quantities of incompletely condensed silsesquioxanes within a few days.

IT 135225-25-1P 135225-26-2P

(prepn. of)

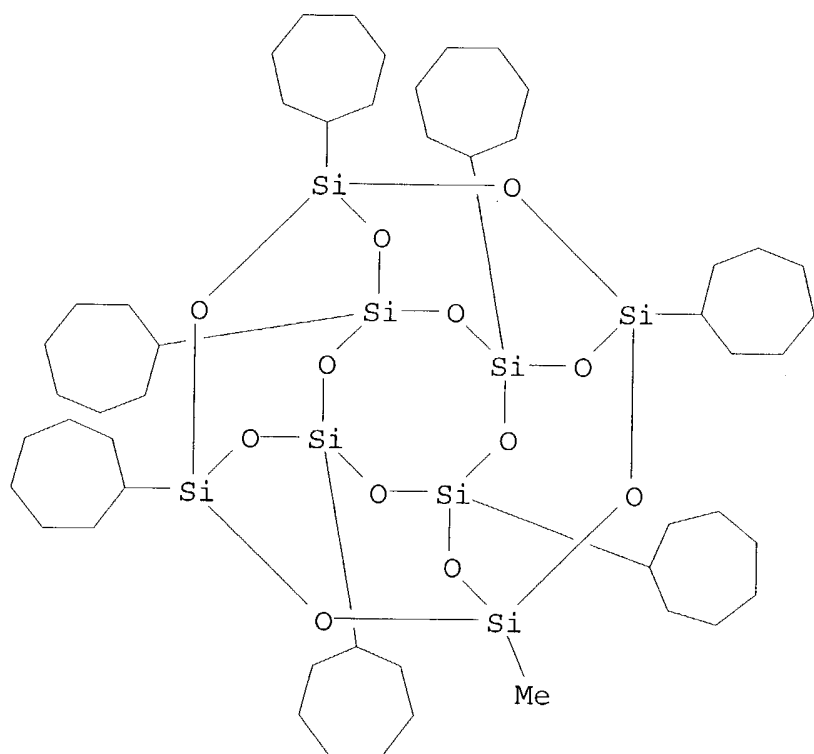
RN 135225-25-1 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, heptacyclopentylmethyl- (9CI) (CA INDEX NAME)



RN 135225-26-2 HCA

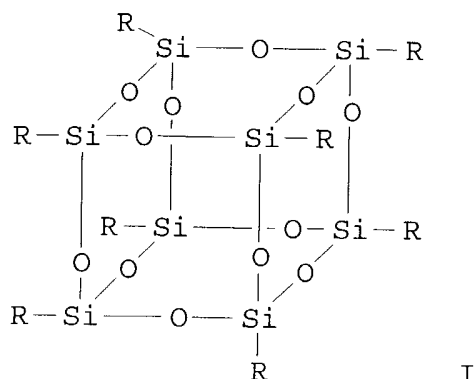
CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, heptacycloheptylmethyl- (9CI) (CA INDEX NAME)



- CC 29-14 (Organometallic and Organometalloidal Compounds)
 Section cross-reference(s): 75
- ST cyclopentylsilane hydrolytic condensation;
oligosilsesquioxane polyhedral; crystal structure
 tetrasilanol silsesquioxane; cycloheptylsilane hydrolytic
 condensation
- IT Crystal structure
 Molecular structure
 (of **polyhedral oligosilsesquioxane**)
- IT 135225-24-0P 135225-25-1P 135225-26-2P
 (prepn. of)

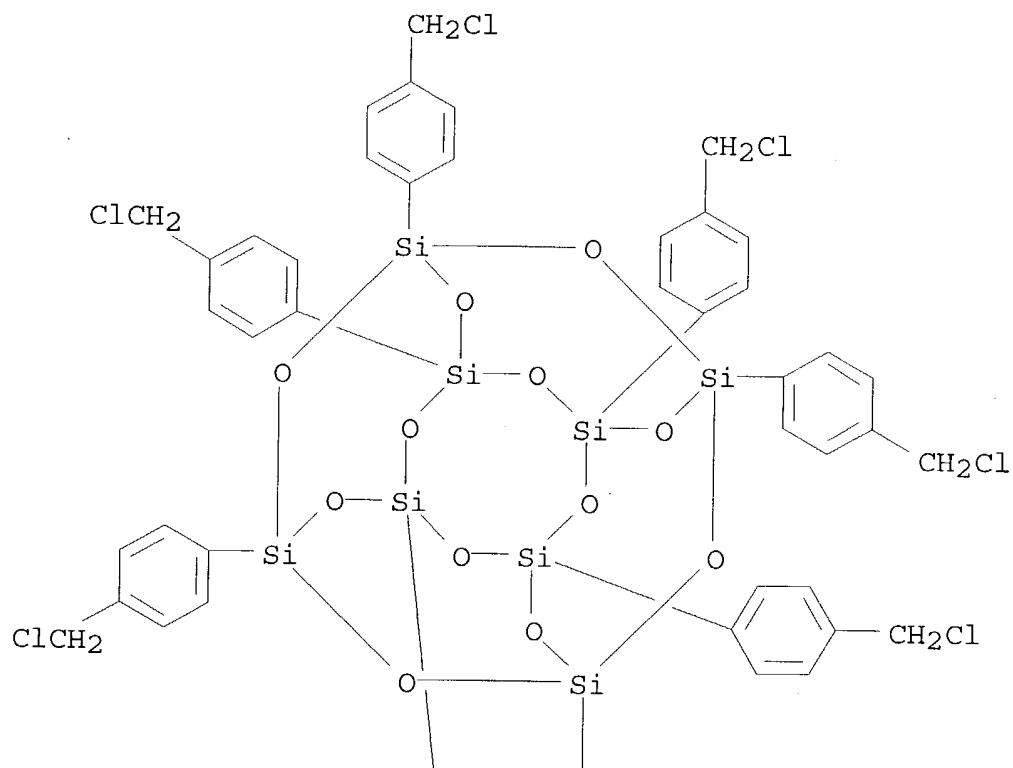
L46 ANSWER 23 OF 24 HCA COPYRIGHT 2003 ACS on STN
 113:24226 Syntheses of highly-functionalized **polyhedral
 oligosilsesquioxanes**. Feher, Frank J.; Budzichowski,
 Theodore A. (Dep. Chem., Univ. California, Irvine, CA, 92717, USA).
 Journal of Organometallic Chemistry, 379(1-2), 33-40 (English) 1989.
 CODEN: JORCAI. ISSN: 0022-328X. OTHER SOURCES: CASREACT 113:24226.

GI

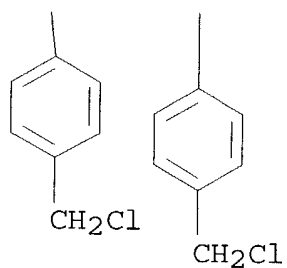


- AB The hydrolytic condensation of p-ClCH₂C₆H₄SiCl₃ in aq. acetone affords [p-ClC₂C₆H₄SiO_{3/2}]₈ (I; R = C₆H₄X-4, X = Cl) a synthetically useful precursor for the syntheses of octafunctional **polyhedral oligosilsesquioxanes** [p-XCH₂C₆H₄SiO_{1.5}]₈, including X = OH, ONO₂, OAs, p-nitrobenzoyl and methylterephthaloyl).
- IT **127800-90-2P**
(prepn. and iodination of)
- RN 127800-90-2 HCA
- CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octakis[4-(chloromethyl)phenyl]- (9CI) (CA INDEX NAME)

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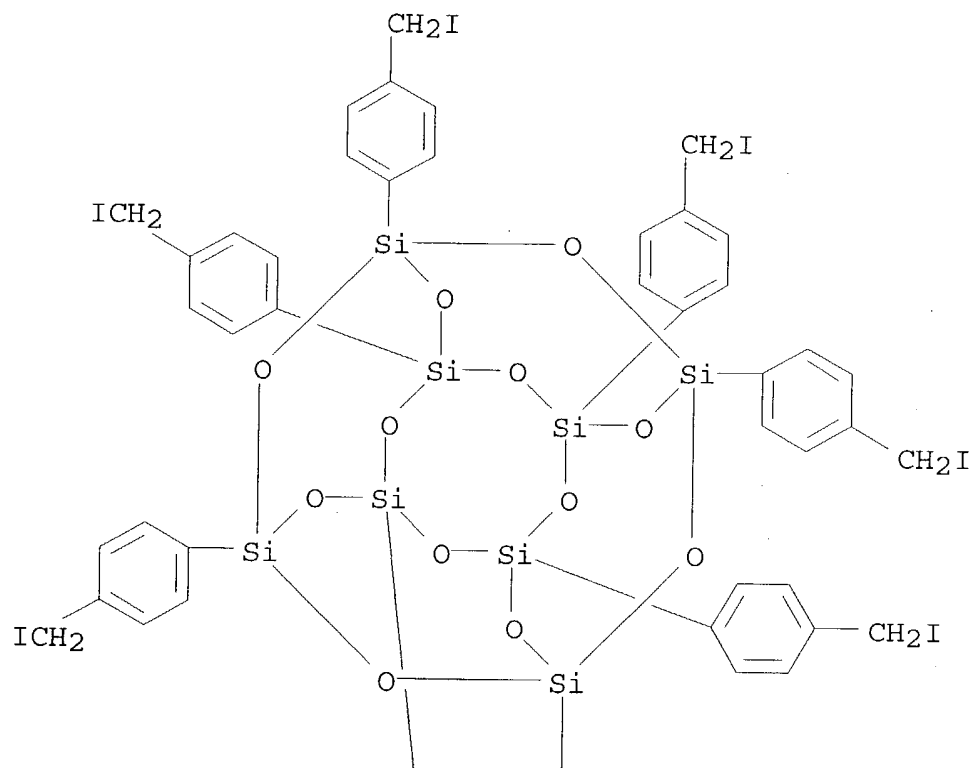


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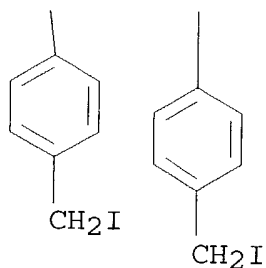


IT 127800-91-3P 127800-92-4P
 (prepn. and reactions of)
 RN 127800-91-3 HCA
 CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octakis[4-(chloromethyl)phenyl] - (9CI) (CA INDEX NAME)

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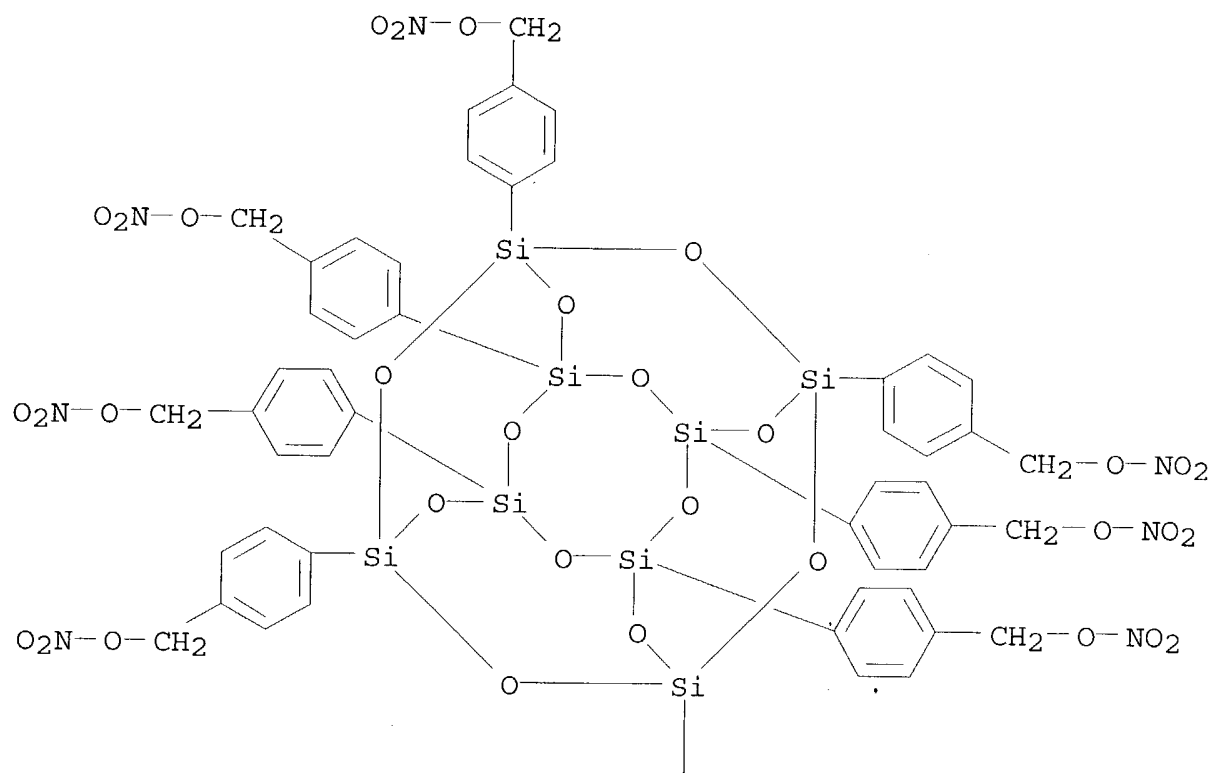


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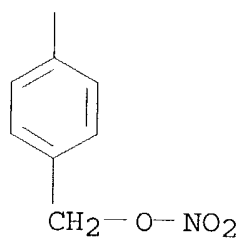


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RN      127800-92-4   HCA
CN      Benzenemethanol, 4,4',4'',4''',4'''',4''''',4''''',4'''''-
pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane-1,3,5,7,9,11,13,15-
octayloctakis- (9CI)  (CA INDEX NAME)
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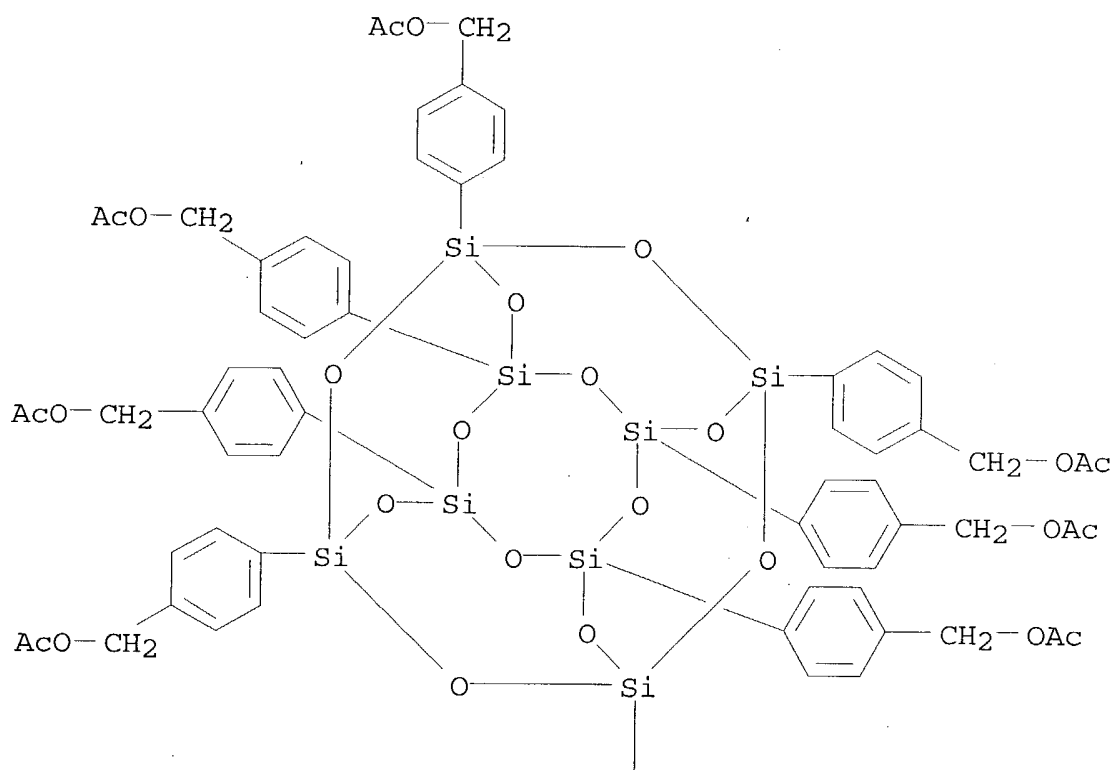


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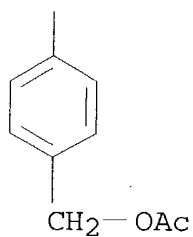


RN	127800-94-6	HCA
CN	Benzenemethanol, 4,4',4'',4''',4'''',4''''',4''''',4'''''- pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane-1,3,5,7,9,11,13,15- octayloctakis-, octaacetate (9CI) (CA INDEX NAME)	

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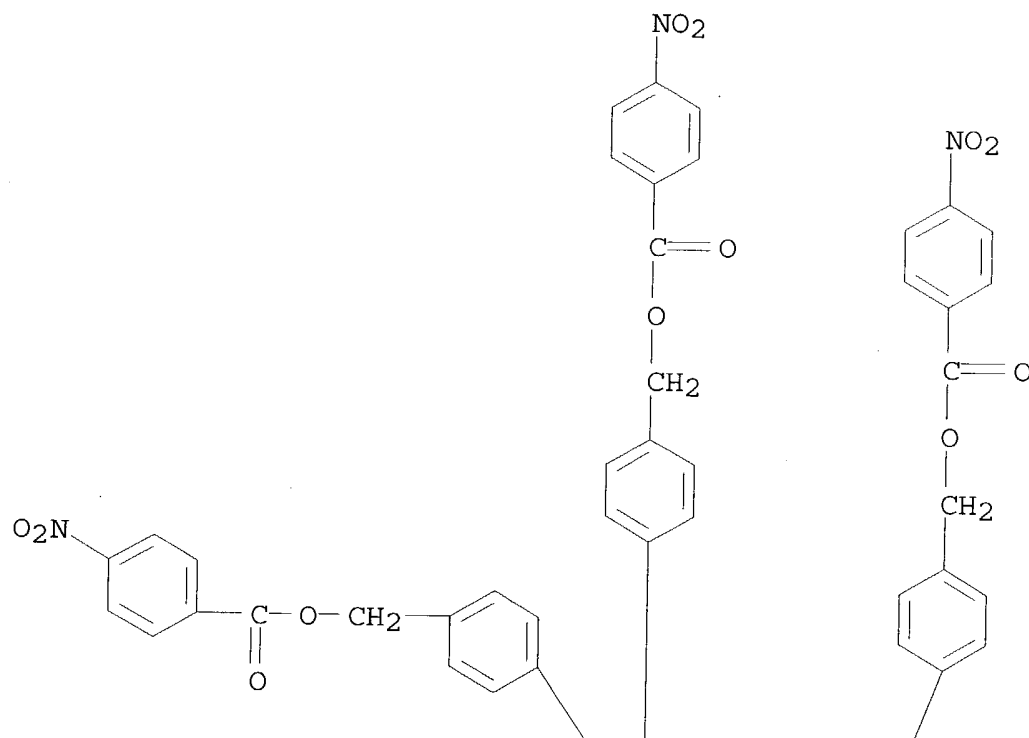


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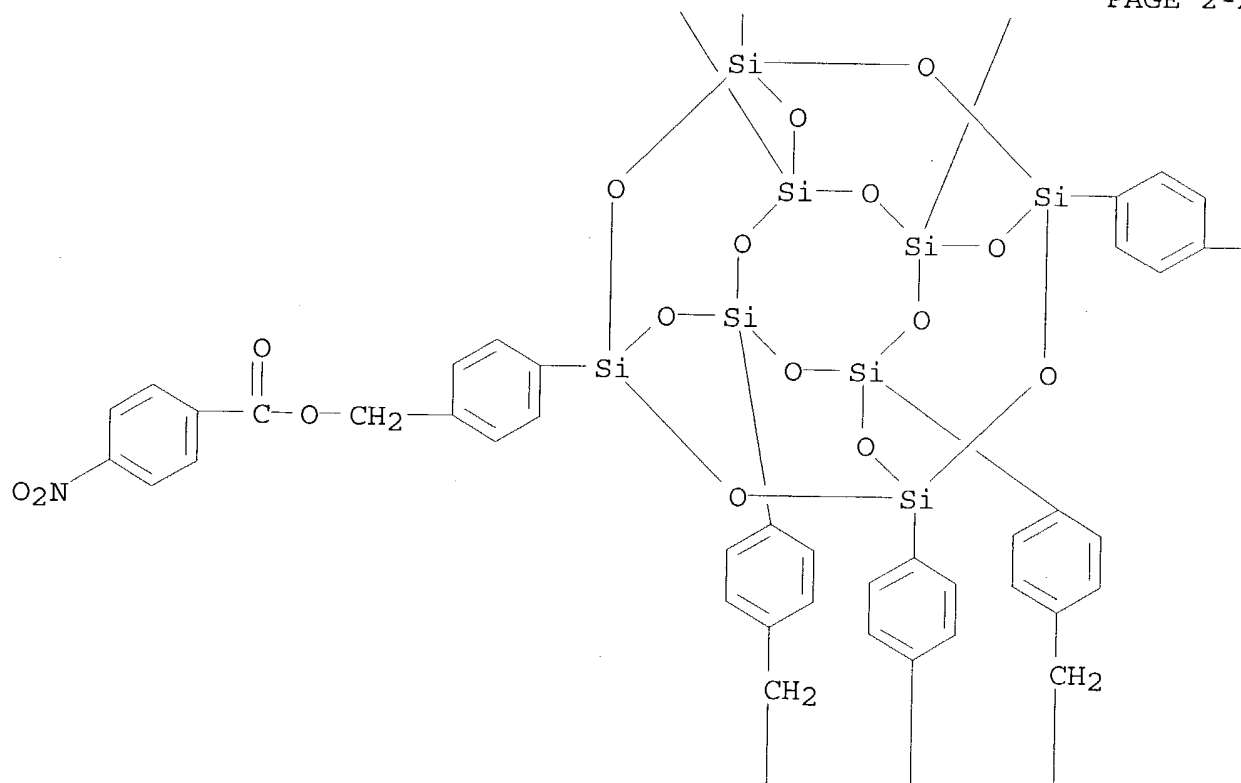


RN 127800-95-7 HCA
 CN Benzenemethanol, 4,4',4'',4''',4'''',4''''',4''''',4''''''-
 pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane-1,3,5,7,9,11,13,15-
 octayloctakis-, octakis(4-nitrobenzoate) (9CI) (CA INDEX NAME)

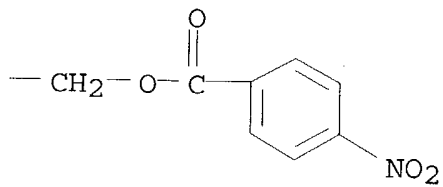
PAGE 1-A

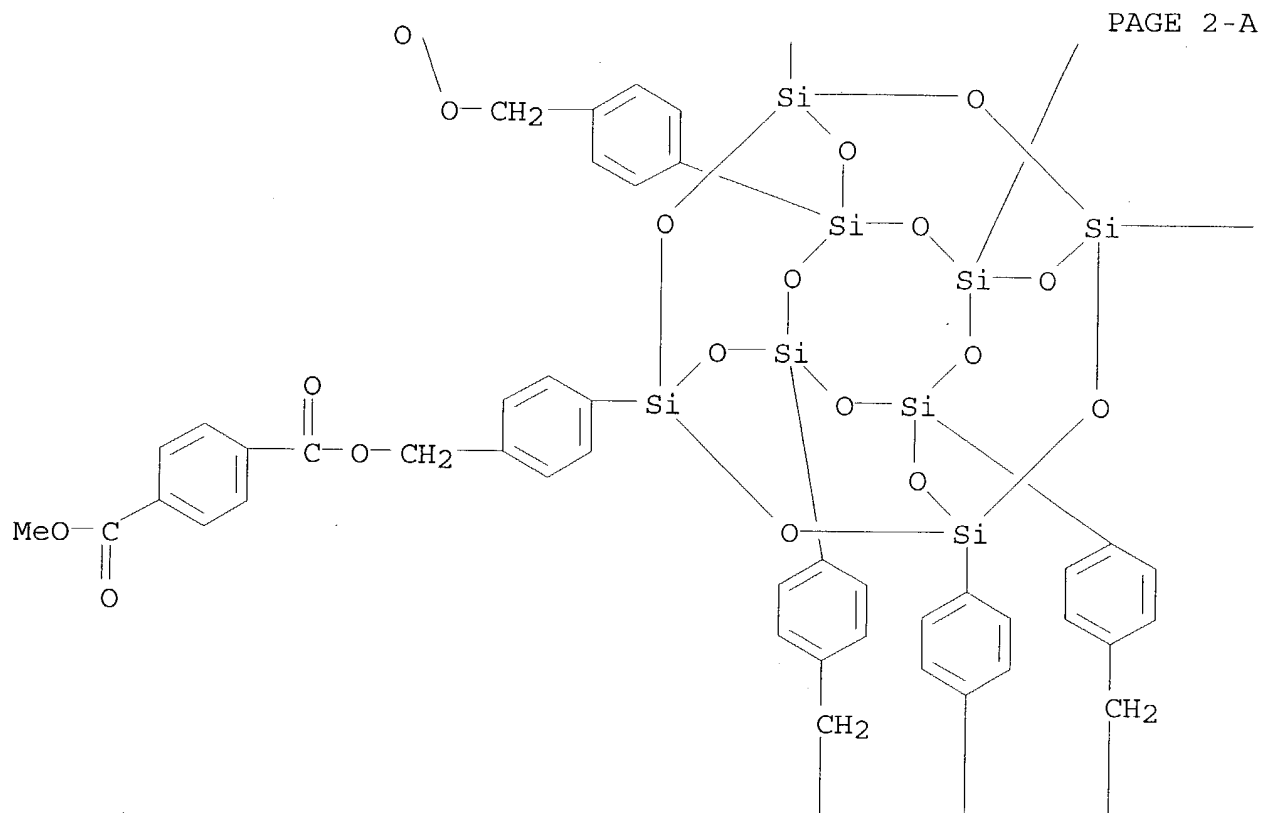


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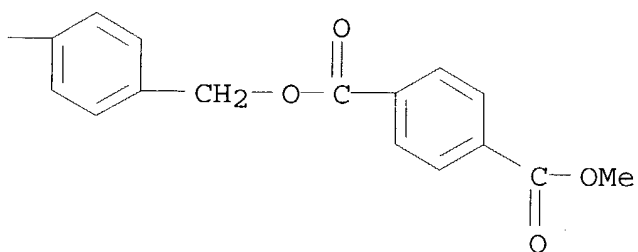


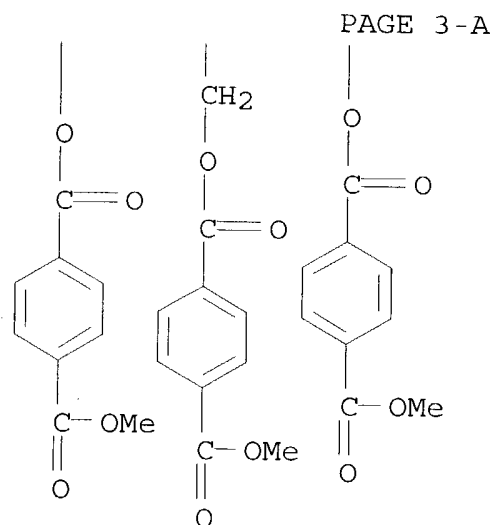
PAGE 2-B





PAGE 2-B





CC 29-14 (Organometallic and Organometalloidal Compounds)
ST chlorosilane hydrolytic cyclocondensation formation

oligosilsesquioxane; polyhedron

oligosilsesquioxane functionalized

IT **Silsesquioxanes**

(**oligo-**, prepn. of, from hydrolytic condensation of organotrichlorosilanes)

IT Cyclocondensation reaction

(hydrolytic, of functionalized chlorosilanes, **oligosilsesquioxanes** from)

IT 100-20-9, 1,4-Benzenedicarbonyl dichloride 122-04-3

(condensation of, with [(chloromethyl)phenyl]

oligosilsesquioxane)

IT 13688-90-9

(hydrolytic cyclocondensation reaction of, **oligosilsesquioxane** from)

IT **127800-90-2P**

(prepn. and iodination of)

IT **127800-91-3P 127800-92-4P**

(prepn. and reactions of)

IT 7783-93-9P **127800-93-5P 127800-94-6P**

127800-95-7P 127822-96-2P

(prepn. of)

L46 ANSWER 24 OF 24 HCA COPYRIGHT 2003 ACS on STN

105:24397 Polyhedral oligometallasilsesquioxanes (POMSS) as models for silica-supported transition-metal catalysts. Synthesis and characterization of (C5Me5)Zr[(Si7O12)(c-C6H11)7]. Feher, Frank J. (Dep. Chem., Univ. California, Irvine, CA, 92717, USA). Journal of the American Chemical Society, 108(13), 3850-2 (English) 1986. CODEN: JACSAT. ISSN: 0002-7863. OTHER SOURCES: CASREACT 105:24397.

AB The hydrolytic condensation of cyclohexyltrichlorosilane in aq.

acetone affords $[R_7(Si_7O_9)](OH)_3$ ($R = \text{cyclohexyl}$). This compd. possesses three OH groups which point toward the vacant vertex of a cube-like **oligosilsesquioxane** framework. Its reaction with $(C_5Me_5)Zr(CH_2C_6H_5)_3$ affords a quant. yield of $(C_5Me_5)Zr[(Si_7O_{12})R_7]$ (same R). The last was characterized by multinuclear (1H , ^{13}C , ^{29}Si) NMR spectroscopy and a single-crystal x-ray diffraction study.

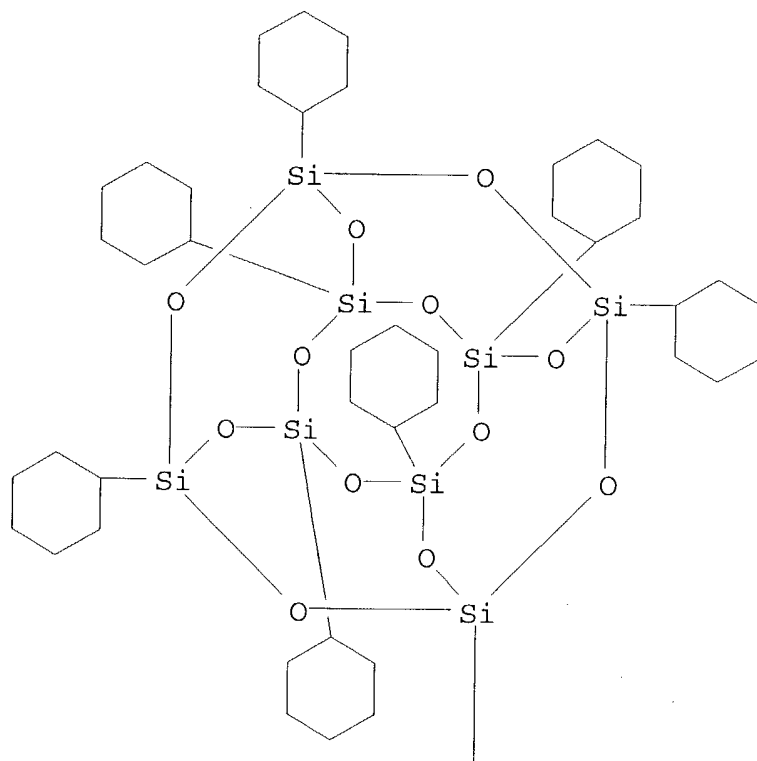
IT **3809-28-7P**

(prepn. of)

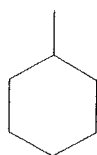
RN 3809-28-7 HCA

CN Pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane, octacyclohexyl-
(7CI, 8CI, 9CI) (CA INDEX NAME)

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CC 29-10 (Organometallic and Organometalloidal Compounds)
Section cross-reference(s): 75
ST polyhedral oligometallasilsesquioxane; crystal structure zirconium
oligosilsesquioxane
IT **3809-28-7P**
(prepn. of)